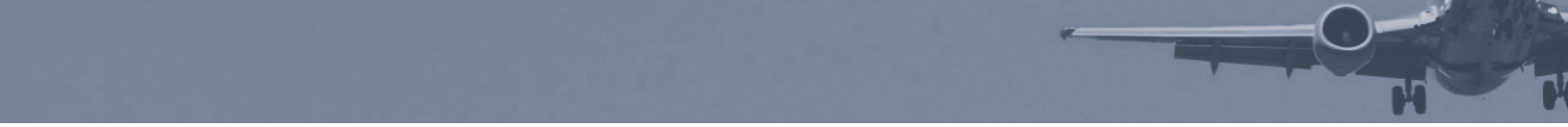
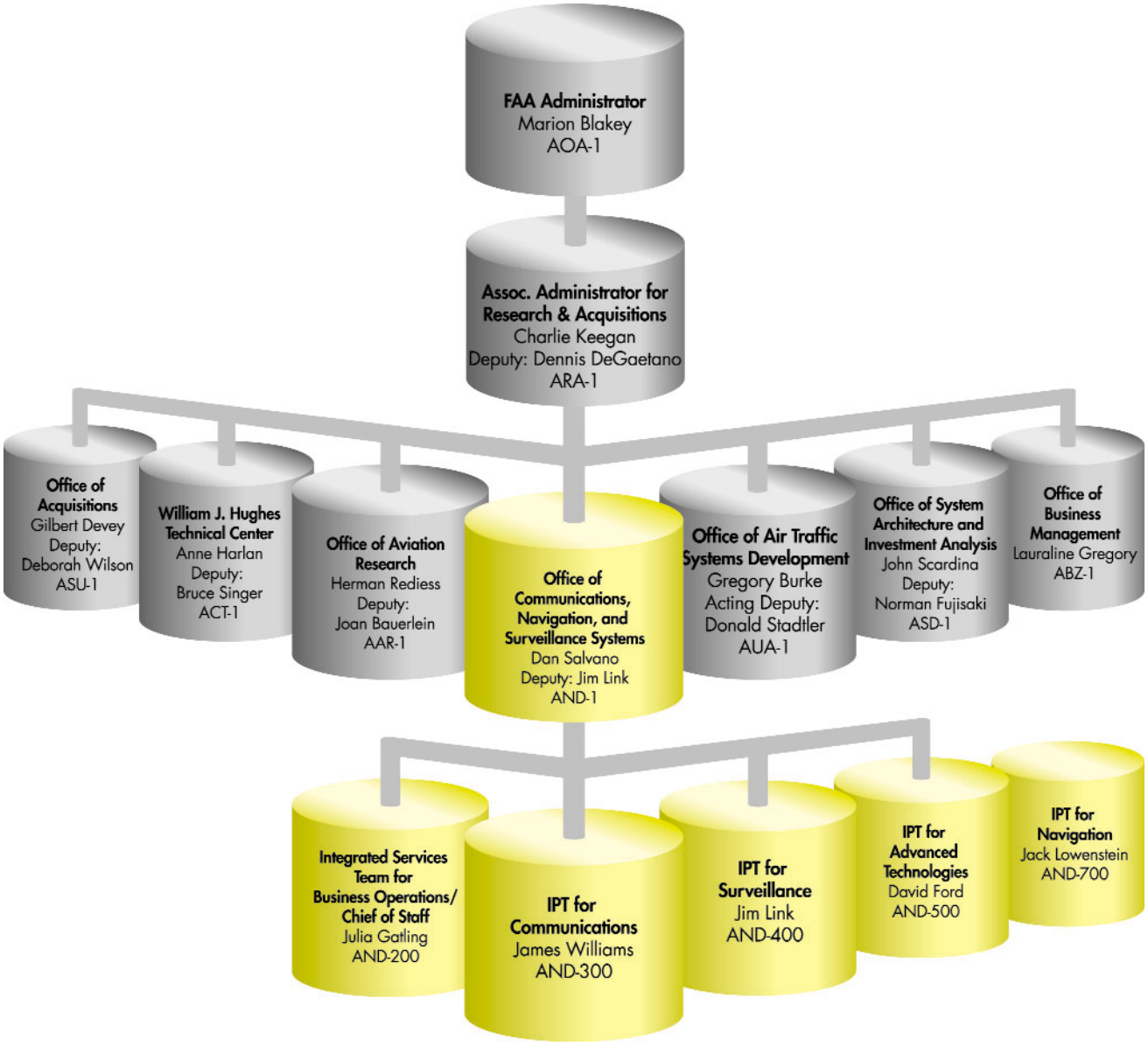
Fiscal Year 2002 Annual Report

Federal Aviation Administration
Office of Communications, Navigation,
and Surveillance Systems (AND)

Produced by

Federal Aviation Administration
Office of Communications, Navigation, and Surveillance Systems (AND)
800 Independence Avenue, SW
Washington, D.C. 20591

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AOA-1
Assoc. Administrator for Research & Acquisitions
Charlie Keegan
Deputy: Dennis DeGaetano
ARA-1
Office of Acquisitions
Gilbert Devey
Deputy:
Deborah Wilson
ASU-1
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Deputy:
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ACT-1
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Herman Rediess
Deputy:
Joan Bauerlein
AAR-1
Office of Communications, Navigation, and Surveillance Systems
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Deputy: Jim Link
AND-1
Office of Air Traffic Systems Development
Gregory Burke
Acting Deputy:
Donald Stadtler
AUA-1
Office of System Architecture and Investment Analysis
John Scardina
Deputy:
Norman Fujisaki
ASD-1
Office of Business Management
Lauraline Gregory
ABZ-1
Integrated Services Team for Business Operations/ Chief of Staff
Julia Gatling
AND-200
IPT for Communications
James Williams
AND-300
IPT for Surveillance
Jim Link
AND-400
IPT for Advanced Technologies
David Ford
AND-500
IPT for Navigation
Jack Lowenstein
AND-700

AND Core Values

HONESTY

Communicates the truth in a timely and straight forward manner through words and deeds

INTEGRITY

Employees/Customers will have confidence that we will honor our commitments

LEADERSHIP

Articulates a compelling vision shared by all

MEANINGFUL WORK

All work in AND is valued and recognized as contributing to the improvement of the NAS

COOPERATION

We actively respect and encourage one another in a mutually supportive environment to achieve common goals

COMPETENCE

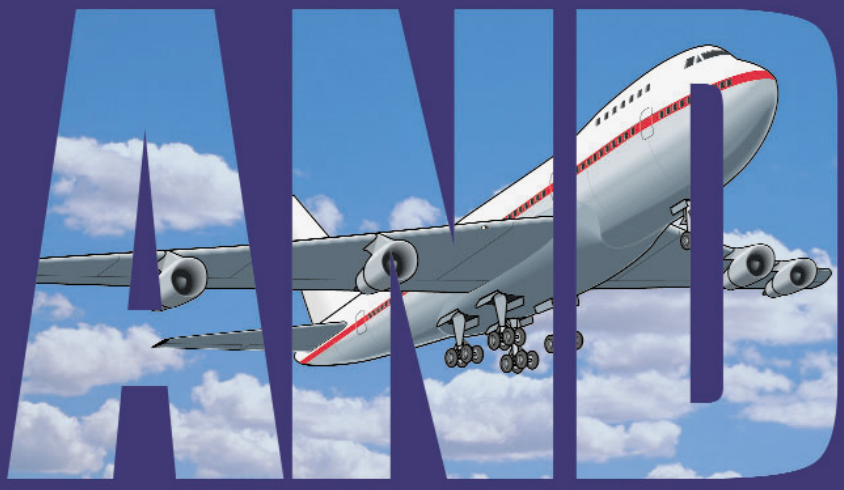
Professionals known for their ability to deliver

RESPECT

We encourage and accept diverse views, opions, needs, and contributions

AND Mission Statement:

"To Acquire Communications, Navigation, and Surveillance Product for the NAS"



AND Vision Statement:

We are a high performing team of diverse and dedicated professionals helping to create a safer and more efficient air transportation system. We care about people and share a set of common values.

Together, we create and maintain a positive environment where everyone excels and our customers feel valued.

I am proud to submit the Federal Aviation Administration (FAA), Office of Communications, Navigation, and Surveillance Systems (AND), Fiscal Year (FY) 2002 Annual Report. This report has been developed to provide both internal and external customers and stakeholders of AND with information about our people, programs, and accomplishments during the past year.

With the tragic memories of September 11, 2001 still fresh in our minds, AND and the rest of the FAA started fiscal year 2002 looking at our programs to see how we could make the National Air Space (NAS) even safer and more secure. The Integrated Product Team for Surveillance (AND-400) has been working with other FAA lines of business, the Department of Defense (DOD), the Department of Homeland Security (DHS), and others to decide what the future surveillance requirements will be with consideration to our ever-changing environment. They have been looking at the role of primary long range radar like the Air Route Surveillance Radar-Model 4, which recently completed deployment, and secondary surveillance radar like the Air Traffic Control Beacon Interrogator-Model 6, which is currently under development. The Integrated Product Team for Communications has been working with the Office of the Deputy Administrator to accelerate the procurement and installation of critical radio equipment between the FAA Command Center and critical NAS field facilities. They have also been working to accelerate the procurement and installation of Ultra High Frequency radios that will improve communications between air traffic controllers and military aircraft participating in security missions in the NAS. AND will continue to use our expertise in the Communications, Navigation, and Surveillance domain to work with the DOD, the DHS, the Transportation Security Administration, and other law enforcement agencies to improve the security and safety of the United States.

We have successfully achieved many of our AND goals:

- In the Next Generation Air/Ground Communications System program, we established government/industry agreements with avionics vendors to develop aircraft avionics – a critical element in moving the program forward.
- The key site installation for Airport Surface Detection Equipment-Model X at Milwaukee, WI was accomplished in September 2002.
- In support of Safe Flight 21, we tested avionics, broadcast services, and vehicle tracking performance (using Automatic Dependent Surveillance-Broadcast and other technologies) during flight tests in Memphis, TN.

Daniel P. Salvano, Director

James C. Link, Deputy Director

- On the Wide Area Augmentation System, we completed the Lateral Navigation/Vertical Navigation system integration and placed all safety monitors on the signal in space. This is a critical step in achieving the contractor acceptance inspection on time.

This has also been a year for change. Former AND Director Carl McCullough left the FAA and accepted the position of Senior Aviation Advisor at the Office of Science and Technology Policy in the White House. I was appointed permanent Director in the Spring of 2002 and Jim Link (formerly AND-400) was selected as the Deputy Director for AND. The Integrated Product Team for Surveillance (AND-400) was also transferred to the Terminal Business Unit. They will be missed as part of the AND family.

This past year, AND continued to make progress not only in the quality of the products and services we provide our customers, but in our internal work environment as well. The AND organization consists of a diverse group of dedicated professionals. Our employees continuously strive to make AND a "people oriented" organization by participating in training, Model Work Environment activities, nominating their peers for various awards and recognitions, and cooperating with each other to achieve our AND goals. Mutual respect for our fellow colleagues, one of our core values, is what contributes to the dynamic and productive atmosphere of the AND organization.

As we look ahead, I expect that the upcoming year will bring many more changes. I also expect that we will see many more accomplishments in all of our programs and with all of our employees. I look forward to a year of continued growth, success, and achievement.

Daniel P. Salvano, Director
Office of Communications, Navigation,
and Surveillance Systems

AND-1 Front Office Staff
(L–R) James Link, Lenora Gant,
Julia Gatling, Daniel Salvano

AND is committed to providing a Model Work Environment for it's employees. Special events like our Annual AND Awards Ceremony, Fall and Spring Festivals and our All Hands meetings give the AND employees a chance to express their concerns and thoughts as well as meet and interact with other AND employees that they may not get to work with on an everyday basis.

AND–200 Team
(L–R) Michelle Chin, Julia Gatling
(Not Pictured) Ken Ward

INTEGRATED SERVICES TEAM FOR BUSINESS OPERATIONS

Mission Statement

To provide business operation services that enable the Office of Communications, Navigation and Surveillance Systems (AND) to effectively develop and deploy products that meet organizational performance goals.

Vision Statement

- Create and maintain a customer oriented business environment.
- Improve employee job satisfaction.
- Improve and maintain organization strategic focus
  - Improve alignment of individual, organizational, and agency goals,
  - Focus resources on Research and Acquisition (ARA) strategic priorities.
- Create an improved business environment through:
  - Improved leadership,
  - Improved management of costs, people, and core business products.

HUMAN FACTORS ADVISOR

Description

Alan Poston, Human Factors Advisor, provides advice and counsel on the application of human factors to AND programs. He monitors Federal Aviation Administration (FAA) acquisition policy, guidance, processes, and best practices and proposes revisions as necessary.

Objectives

- Provide direct human factors support to AND programs, including assisting AND offices in the hiring of human factors personnel.
- Provide human factors awareness training.
- Assist in the preparation of standards, design criteria, guidelines, and similar materials.
- Assist in identification and acquisition of necessary human factors tools, capabilities, and techniques.
- Recommend changes to FAA human factors policy and guidance.

Accomplishments

- Served as AND's point of contact for Goal #2 of the ARA Performance Plan.
- Completed a human factors assessment of AND's programs.
- Assisted in the update of the Human Factors Acquisition Five Year Plan.
- Participated in the AFSSVS* Operational Capabilities Test.
- Participated in the NEXCOM latency simulation investigation.
- Participated in the ASDE-X Display Requirements Evaluation.
- Participated in the development of LAAS controller display concept screens.
- Provided direct human factors support to the following programs:

AFSSVS	TLS	ASDE-X
WAAS	LAAS	NEXCOM
ASR-9 SLEP	ASR-11	MIAWS
RWSL	AMB	GMB
RVR	ILS	LPDME

*Please see Acronym List on Page 59 for definitions.

Alan Poston, Human Factors Advisor

AND–210 Team
(Front L–R) Carol Jarrett, Bettie Porter, Jennifer Sullivan; *(Back L–R)* Michele Orsino, Bob Stanzione, Julia Gatling, Michelle Chin

FINANCIAL MANAGEMENT TEAM

Description

The Financial Management Team, led by Bob Stanzione, provides administrative, programmatic and financial management for AND. Facilitates optimum use of public funds, emphasizes better business practices and fosters improvements in growth and development of the AND organization.

Objectives

- Support the AND Integrated Product Teams (IPTs) in institutionalizing life cycle acquisition organization concepts for an effective, efficient, and flexible acquisition management system.
- Create and maintain a customer oriented business environment through improved management of costs, people, and core business processes.
- Provide management, oversight, and reporting of AND Personnel, Compensation, Benefits and Travel (PCB&T) funds.

Accomplishments

- Assisted IPTs in updating, validating and reporting program reviews/baselines (cost, schedule, and performance).
- Produced and provided budget formulation and execution processes, procedural changes and guidance affecting Facilities & Equipment and Operations Appropriations.

HUMAN RESOURCE MANAGEMENT TEAM

Description

The Human Resource Management Team, led by Brenda Brooks, is responsible for the overall AND human resource operations, program development and employee development.

Objectives

- To assist IPTs in efforts to move AND closer to reflecting the National Civilian Labor Force in the professional, technical and engineering categories.
- To provide corporate training for AND employees.
- To support management in human resource management and labor management relations.

Accomplishments

- Thirty-two new employees were appointed in Fiscal Year (FY) 2002. Fifty-seven percent of those appointed were either minority and/or female. Four entry-level employees were hired in the engineering and/or professional job categories. Overall, a total of nineteen or fifty-nine percent of the employees appointed were in the engineering and/or technical job categories. We were also able to use several of our flexible staffing authorities, e.g., Direct Hire Authority for Entry-Level Engineers and the Superior Academic Achievement Appointment Authority.
- Fourteen in house training courses were sponsored for AND employees. A total of 253 employees were trained in management, labor relations and other areas.
- Monthly meetings were held with AND management to keep them updated on human resource and labor management relations program activities and issues.

AND–220 Team
(Front L–R) Brenda Kilgore, Ann Waring, Pat Spatarella; *(Back L–R)* Brenda Brooks, Kenneth Sessions
(Not Pictured) Bessie Venable, Richelle Greene, Kathy Roberts, Peggy Glorius

AND–230 Team
(Front L–R) Kris McKinzie, Rajendra Saroop, Karen Clanton, Virginia Perando; *(Back L–R)* Harvey Fort, Herman Tharrington, Keith Kratzert, Ken Kepchar, Henry Gregory

PROGRAM MANAGEMENT TEAM

Description

The Program Management Team, led by Herman Tharrington, provides a business foundation that enables AND personnel to effectively develop and deploy products and services that meet organizational goals and objectives.

Objectives

- Continuously improve organizational strategic focus
  - – Alignment of individual, organizational, and agency goals, objectives, performance targets and measures.
  - – Management of core business processes using techniques such as knowledge management and objective negotiations.

Accomplishments

- Information Security (INFOSEC) lead for AND.
- Risk Management Training given to IPTs, FAA Technical Center and VOLPE personnel.
- Developed an AND Multi-Year Process Improvement Acton Plan for FY03-05.
- Achieved an interim Capability Level 2 in three process areas.
- Provided Earned Value Management (EVM) training support, and systems engineering support to IPTs.
- Coordinated AND Executive Level Metrics (ELMs) and briefed AND/AUA ELMs to ARA management.
- Continued process to institutionalize risk management at program reviews.
- Supported Department of State request for use of excess equipment by the Afghanistan Interim Authority (AIA).
- Cost Accounting System/Labor Distribution (CAS/LDR) lead for AND. Provided support to sub-teams and served as the lead AND Quality Assurance Resource.
- Manage the monthly Master Schedule Baseline Report (MSBR).
- Facilitated FAA Logistics Center "fee-for-service" briefing for National Airspace System (NAS) stored equipment.
- ARA lead for the National Capitalization team in support of a clean audit.
- AND member of the DELPHI Projects Accountability Business Process Policy Board.

AND–300 Front Office Staff
(Front L–R) Jackie Haselrig, Sandra Anderson, Brenda Palmer; *(Back L–R)* Carol Bell, Jim Williams, Bruce Eckstein, Jim Little
(Not Pictured) Jim Eck

COMMUNICATIONS INTEGRATED PRODUCT TEAM

Mission Statement

To acquire communications products for the National Airspace System – for today and for the future.

Product Team Structure

The AND-300 Communications Integrated Product Team, led by James Williams, acquires and delivers the equipment necessary to maintain and increase the capacity of the National Airspace communications system. Reliable communications are essential for the safe and efficient control of aircraft through all phases of flight. AND-300 is composed of two product teams as follows:

Voice Switching and Recording

Product Team Lead: James Little

Responsible for the management and acquisition of Terminal Voice Switch Replacement (TVSR) Systems, which includes the Enhanced Terminal Voice Switch (ETVS) and the Conference Control System (CCS). AND-320 is also responsible for the Voice Recorder Replacement Program (VRRP). This includes the Digital Voice Recorder System (DVRS), the Automated Flight Service Station Voice Switch (AFSSVS), and the Voice Switching and Control System (VSCS).

Air/Ground Communications

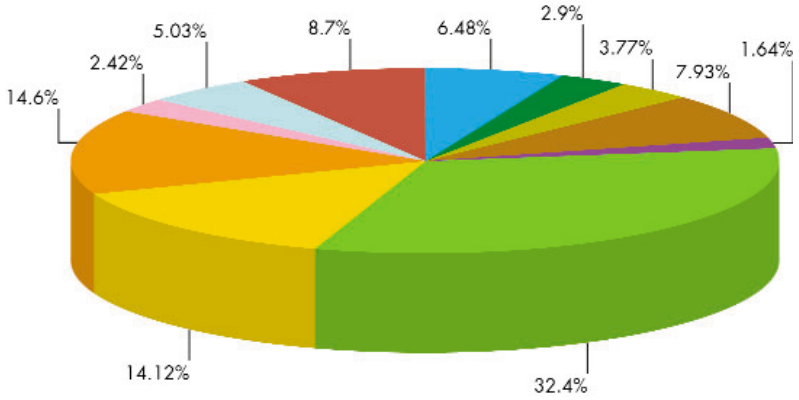
Product Team Lead: James Eck, acting

Responsible for the acquisition and implementation of communications equipment that supports Air Traffic Control (ATC) operation throughout the NAS. The Air/Ground Communications team is responsible for the Next Generation Air/Ground Communications System (NEXCOM), as well as several programs which will continue to provide the equipment, services, and implementation funding necessary to sustain and grow capabilities during the transition to NEXCOM. These include: Back Up Emergency Communications (BUEC) and Communications Facility Enhancement (CFE), Ultra High Frequency (UHF) Radio Replacement, Radio Control Equipment (RCE), and Radio Frequency Interference Elimination (RFI).

Goal for FY03

- Draft FAA future communications architecture by September 2003.

FINANCIAL DATA



FY02: $103.4 million

CFE	$6.7 million
LRR/UHF	$3 million
RCE	$3.9 million
BUEC	$8.2 million
RFI	$1.7 million
NEXCOM	$33.5 million
VSCS	$14.6 million
ETVS/RDVS	$15.1 million
CCS	$2.5 million
VRRP	$5.2 million
AFSSVS	$9 million

AND–320 Team
(Front L–R) Mike Evans, George Clark, Jim Little, Cynthia Valdes, Jenny Perez; *(Middle L–R)* Doug Sanders, Dan Duncan, Amy Lopez, John Sze, Brent Derrick; *(Back L–R)* Mike Goldstein, Ed Hand, Jim Miller, Rodney Taquino, Martin Robinson *(Not Pictured)* Roger Smith, Clarissa Riffe, Jesse Concepcion

VOICE SWITCHING AND RECORDING PRODUCT TEAM

VOICE SWITCHING AND CONTROL SYSTEM

Description
Provides a communications system for ground to ground, and air to ground, voice connectivity for air traffic control operations in the twenty-one Air Route Traffic Control Centers (ARTCCs).

Objectives
- Deliver equipment in support of the Chokepoint Initiative.

Accomplishments
- Completed delivery of all VSCS equipment necessary to support the next 8 chokepoint sectors. (5/02)

Voice Switching and Control System (VSCS)

VOICE SWITCHING AND CONTROL SYSTEM – CONTROL SYSTEM UPGRADE

Description
Replaces obsolete, non-supportable VSCS control system hardware and software at the 21 ARTCCs and the FAA Technical Center. The VCSU development and testing phases are nearing completion. Installations will begin in early 2003.

Objectives
- Purchase equipment in support of the upgrade of Voice Switching Control equipment at the 21 ARTCCs.

Accomplishments
- Purchased VCSU servers for all 21 ARTCCs. (8/02)

Goals for FY03
- Deliver the VSCS/VCSU at nine ARTCCs by 9/30/03.

Digital Voice Recorder System Model 2 (DVR2)

VOICE RECORDER REPLACEMENT PROGRAM DIGITAL VOICE RECORDING SYSTEM

Description
This project provides legal recording capabilities at Air Traffic Control Towers (ATCT), Terminal Radar Approach Control (TRACON), Automated Flight Service Station and ARTCC facilities.

Objectives
- Deliver 56 DVRS systems.

Accomplishments
- Delivered 61 DVRS systems – 54 FAA and 7 Department of Defense (DoD). (9/02)

Goals for FY03
- Deliver 50 DVR systems by 9/30/03.

Enhanced Terminal Voice Switch (TVSR/ETVS)

ENHANCED TERMINAL VOICE SWITCH

Description
Provides integrated digital voice switching systems in ATCTs and TRACONs that provide communications between air traffic control operator positions, radio channels, and interphone land lines. ETVS replaces obsolete electronic mechanical and aging electronic voice switching systems in the NAS.

Objectives
- Deliver 50 ETVS systems at ATCT/TRACON locations. (FAA and DoD)

Accomplishments
- Delivered 67 systems – 22 FAA and 45 DoD. (9/02)

Goals for FY03
- Deliver 60 ETVS systems by 9/30/03.

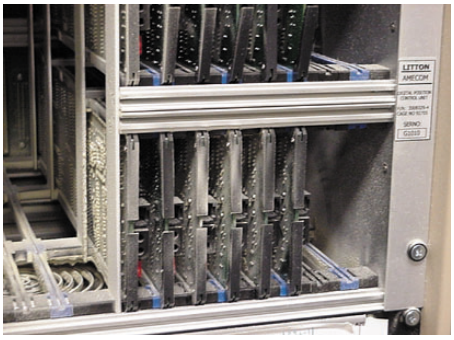
Northway, Alaska Flight Service Station (Northway AFSS)

AUTOMATED FLIGHT SERVICES STATION VOICE SWITCH

Description
AFSSVS replaces the existing switches in the Automated Flight Service Stations with new digital voice switches.

Objectives
- Award development contract.

Accomplishments
- Contract award completed June 21, 2002.



Rapid Deployment Voice Switch IIA (RDVS IIA)
Smoke & Fire Extinguisher damage to equipment in racks

RAPID DEPLOYMENT VOICE SWITCH
Six weeks before the planned certification of initial operating capability at the Potomac Consolidated TRACON, the RDVSIIA system there was severely damaged in a fire. The chemical fire retardant used to extinguish the fire also caused damage to the system. The entire system was removed and shipped back to the Northrop Grumman factory for cleaning, damage assessment, and repair. It was reassembled, reinstalled, and became operational just over one month after the fire, saving $1 million over the cost of a new system. The work of all those involved helped the system to be repaired quickly with no adverse impact to the Potomac TRACON commissioning schedule.

AND–360 Team
(Front L–R) Jim Eck, Felicia Thompson, George O'Neill, Tanvir Haque, Adam Gayzik, Karol Kerns, Rita McNair, Sandra Anderson; *(Back L–R)* Orville Johnson, Bruce Siebenthall, Ed Cornell, Joel LaFerriere, Dieter Thigpen, Geoff Chisholm, Paul Travis, Guy Corneille, David Ingram, Susan Burmester, Robert Dinh, Derek Hamilton, Greg Schaefer
(Not Pictured) Tom Cleary, Peter Vogt, Barbara Cassidy

AIR/GROUND COMMUNICATIONS PRODUCT TEAM

BACK UP EMERGENCY COMMUNICATIONS

Description
Provides a dedicated, diverse back up radio channel for every en route air traffic controller at all twenty continental United States centers as well as Hawaii and Puerto Rico.

Objectives
• Complete installation of one new BUEC system at an ARTCC.

Accomplishments
• Completed installation of a new BUEC system at Houston, TX on 8/1/02.

Goals for FY03
• Install BUEC at two ARTCCs by 9/30/02.

COMMUNICATIONS FACILITY ENHANCEMENT

Description
Provides equipment and funds to establish new, expand or relocate existing controller to pilot air traffic control radio communications for all types and phases of flight. Develops the technical requirements for and the procurement of the radios, racks, antennae, and other ancillary equipment required to provide effective air traffic control communications.

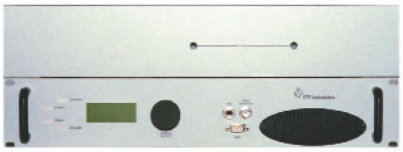
Objectives
• Deliver CFE equipment for the next 8 chokepoint sectors.

Accomplishments
• Completed delivery of equipment in support of the next 8 chokepoint sectors. (3/02)

Back Up Emergency Communications (BUEC)
Carlton GA, Atlanta Center
West Departure Control

Southern California Terminal Radar Approach Control (TRACON)

Receiver



High Power Transmitter

Low Power Transmitter

NEXCOM Multimode Digital Radios

Goals for FY03

- Complete source selection activities for the CFE/Ultra High Frequency Radio Replacement Program by 11/30/02.

NEXT GENERATION AIR/GROUND VHF COMMUNICATIONS PROGRAM

Description

Provides for the replacement of the existing analog radios used in the NAS with new state-of-the-art digital radios. Provides the capability to accommodate additional sectors and services. Reduces logistical costs. Replaces expensive to maintain VHF radios. Provides data link communications capability. Reduces air/ground radio frequency interference. NEXCOM is the Next Generation Air/Ground Voice and Data Communications System for the next 30 years. NEXCOM will increase the current communications capacity three to four times.

Objectives

- Establish a government/industry agreement for avionics development.
- Release a ground system engineering development model screening information request.
- Complete analog voice initial operating capability.

Accomplishments

- Completed a government/industry agreement for avionics development. (12/01)
- Completed ground system engineering development model screening information request. (4/02)
- Analog voice initial operating capability is currently estimated for completion in the first quarter of FY03.

Goals for FY03

- Complete System Demonstration One by 11/30/02.
- Complete source selection activities for the Rapid Preliminary Development Effort (RPDE) by 11/30/02.
- Provide Notice of Proposed Rulemaking (NPRM) and submit for internal agency review by 7/31/03.
- Produce 325 NEXCOM Multimode Digital Radios by 9/30/03.

RADIO COMMUNICATIONS EQUIPMENT

Goal for FY03

- Install 100 channels by July 2003.

Communications Facilities Enhancement (CFE/UHF) – Ultra High Frequency Radio Replacement Program will provide new equipment to continue the smooth communication between Air Traffic Controllers and military aircraft.

Lt. Col. Mike Cosby 177th Fighter Wing commander, prepares to land the F-16C Block 25 at the Atlantic City International Airport in New Jersey. The Atlantic City International Airport is home to the 177th FW, New Jersey Air National Guard. (U.S. Air Force photo by MSgt. Don Taggart)

AND–400 Front Office Staff
(Front L–R) Brenda Wedding, Don Turnbull, James Link, Shamar Middleton;
(Back L–R) Bill Collins, Len Leps, Viscount Thurston, Herb Goldstein, Mary Kay Born

SURVEILLANCE INTEGRATED PRODUCT TEAM

Mission Statement

To provide the best possible surveillance and weather products/services for our customers and users.

Product Team Structure

The Surveillance Integrated Product Team consists of one Services Group and four Product Teams, which are each responsible for the management and acquisition of a particular group of surveillance systems for use in the NAS.

The Product Teams and their programs are as follows:

Airport Surface Products

Product Lead: Maria B. Tavenner

Airport Movement Area Safety System (AMASS), Airport Surface Detection Equipment – Model 3 (ASDE-3)

Surveillance & Weather Integrated Services Products

Product Lead: Carmela Vaccarella

Airport Surveillance Radar - Model 9 (ASR-9), Mode Select Radar (Mode S), Terminal Doppler Weather Radar (TDWR), Weather Systems Processor (WSP), Next Generation Radar (NEXRAD), Medium Intensity Airport Weather System (MIAWS), and Low Level Wind Shear Alert System (LLWAS)

Terminal Surveillance Products

Product Lead: Vincent Capezzuto

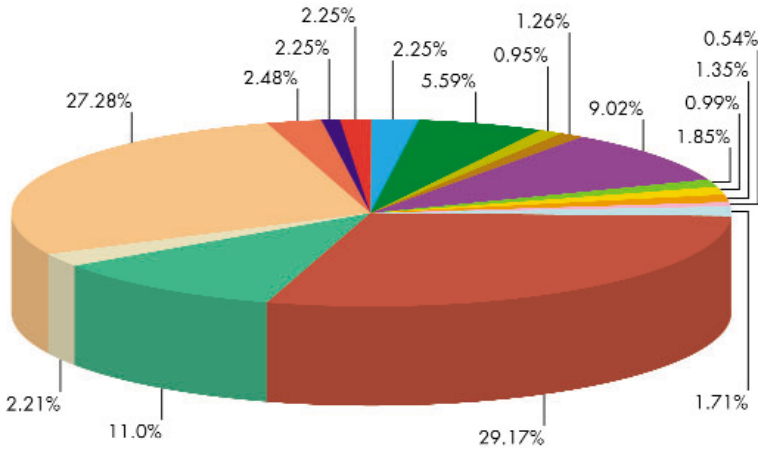
Airport Surveillance Radar – Model 11 (ASR-11) and Airport Surface Detection Equipment – Model X (ASDE-X)

En Route Surveillance Products
Product Lead: William McGovern
Air Route Surveillance Radar – Model 4 (ARSR-4), Air Traffic Control Beacon Interrogator – Model 6 (ATCBI-6), Long Range Radar (LRR), Precision Runway Monitor (PRM), and Gulf of Mexico Program (GOMP)

The Services Group and its areas of responsibility are as follows:

Surveillance Systems Engineering Group
Group Lead: James Rogers
Systems Engineering, Configuration Management, Environmental and Natural Resource Management, System Safety (Including Occupational Health and Safety)

FINANCIAL DATA



FY02: $221.8 million

ASDE-3 SLEP	$5.0 million
AMASS	$12.4 million
Mode S	$2.1 million
ASR-9	$2.8 million
ASR-9 SLEP	$20.0 million
NEXRAD	$4.1 million
MIAWS	$2.2 million
TDWR	$3.0 million
LLWAS	$1.2 million
WSP	$3.8 million
ASR-11	$64.7 million
ASDE-X	$24.4 million
GOMP	$4.9 million
ATCBI-6	$60.5 million
OX-60	$5.5 million
LRR	$2.2 million
PRM	$3.0 million

AND–402 Team
(L–R) Chuck Gould, Katherine Williams, Jerry Schwartz
(Not Pictured) James Rogers, Jaqueline Hill, Arthur Levy, Michael Plunkett, Carmine Primeggia, William Syptak, Doug Hodgkins*, J Messimore*

* contractor

SURVEILLANCE SYSTEMS ENGINEERING

Description

The Surveillance Systems Engineering Group, AND-402, provides systems and specialty engineering services for the Surveillance Integrated Product Team and to the individual product teams within AND-400. Its mission is to explore new concepts to meet current and future surveillance needs consistent with NAS architecture, to address systemic engineering issues, and to provide configuration management and environmental and safety support to the product teams.

ENVIRONMENT AND NATURAL RESOURCE MANAGEMENT

Description

The AND-402 environmental team supports AND product teams to ensure compliance with FAA environmental policies and regulations and federal environmental laws. The team also promotes environmentally sound implementation of programs and projects.

Objectives

- Provide environmental compliance support to AND Product Teams for implementation of surveillance, navigation, and communication equipment.
- Provide expertise and solutions in natural resource management issues, such as bird deterrence and impact mitigation.
- Provide environmental regulatory programmatic support and liaison to other FAA organizations, as needed.

Accomplishments

- Completed environmental milestones for fourteen ASR-11 sites. Prepared and presented the ASR-11 program's strategy for preventing obstructions from interfering with radar performance.
- Developed a NAS change proposal to FAA Order 6310.6 waiving requirement for 1500-foot building restrictive easements.

- Provided environmental support to the ASDE-X team, developing the ASDE-X Environmental Guidance document and Environmental Effects checklist. Reviewed various data packages and program documents. Completed Categorical Exclusions for the Milwaukee, WI ASDE-X system and Orlando, FL Surface Movement Radar (SMR) equipment installation and operation.
- With the LLWAS Product Team and the U.S. Fish and Wildlife Service, accomplished the development and initial, low-rate production of devices to deter bird perching on sonic weather sensors.
- Analyzed the status of existing National Environmental Policy Act (NEPA) documentation for airports that might receive PRM equipment, to determine what environmental work would be necessary for PRM installation.
- Performed site reconnaissance and completed Phase I Environmental Due Diligence Audits for decommissioning long-range radars at Fort Lonesome, FL and Fort Fisher, NC. Performed a site visit to the former AN/FPS-66 radar facility at Crescent City, CA, and coordinated ongoing analysis of site contamination and decommissioning.
- Reviewed the Air Force's preliminary Draft Environmental Assessment and supported FAA and Air Force efforts to site a solar-powered ATCBI-6 in Saline Valley, near Death Valley National Park, CA.
- Completed the Environmental Assessment for relocation of the ASDE-3 to a standalone tower at Reagan National, including issuance of Draft and Final Environmental Assessments, placement of public notices, and distribution of the Finding of No Significant Impact. Obtained project approval from the National Capital Planning Commission.

ASR-11 sail ladder and obstruction light

ASR-11 tower stairs

SYSTEM SAFETY SUPPORT

Description

The AND-402 safety team supports AND Product Teams to ensure compliance with FAA safety policies and regulations and federal safety laws. The team also supports the system safety and occupational safety and health needs of the product teams through interfacing with AFZ-800.

Objectives

- Provide safety liaison between the AND-400 product teams and AFZ-800 to ensure timely resolution of product team safety issues.
- Provide safety and health regulatory programmatic support and liaison to other FAA organizations, as needed.

Accomplishments

- Provided safety compliance liaison between AFZ-800 and the AND-400 IPTs, coordinating resolution of safety compliance issues of the AMASS, ASDE-X, ASR-11 and ATCBI programs.

CONFIGURATION MANAGEMENT

Description

The AND-402 configuration management team provides detailed configuration management knowledge and expertise to ensure that functional and physical characteristics of surveillance system configuration items meet the requirements detailed in the statement of work and associated baseline documentation during all phases of the system's life cycle.

Objectives

- Develop and maintain an effective and efficient web based configuration management capability with easy accessibility by all users reducing paper costs and processing schedules.
- Provide a centralized configuration and change control capability for all surveillance products and interfaces.
- Provide configuration management programmatic support and liaison to surveillance product teams and other FAA organizations, as needed.
- Conduct functional and physical configuration audits (FCA/PCA) of surveillance products.

Accomplishments

- Provided the surveillance configuration management perspective:
  - During the National Configuration Management Working Group, National Regional Working Group, and National FAA Modification Working Group.
  - With ACM-20 and SETA II in developing a configuration management On-Line module for the NAS Configuration Control Board.
  - Provided subject matter expert support to the ACM-20 WebCM Core Team.
  - Participated in the 1800.66 Configuration Management Working Groups to scrub the section on configuration management for facility baselines.
- Participated in the in service review (ISR) Group of an ASDE-X off-site in San Francisco, CA to ensure the team is ready for in service decision (ISD) at Milwaukee, WI.
- Participated in a three-day ASDE-X off-site in Milwaukee, WI to discuss and plan the "Shared Vision Through September 2005".
- Conducted FCA/PCA for the LLWAS-RS program.
- Coordinated and conducted ATCBI-6 Delta physical configuration audit activity with the FAA Audit Team and Raytheon at Raytheon Ltd., in Harlow, England.
- Developed, distributed for review and signature, and submitted to Surveillance Change Control, the ATCBI-6 Product Baseline case file for processing.
- Conducted a physical configuration audit in Stockton, CA for the ASR-11 program to document the configuration of the baseline going into system acceptance testing.
- Conducted a pre-audit review of the Buoy Communications System program in Mississippi, to ensure the readiness for the formal functional and physical configuration audits scheduled for the spring.
- Developed the ASDE-X configuration management plan for review by the team and approval by the Surveillance Configuration Control Board.

SYSTEMS ENGINEERING

Description

The system engineering team provides systems and specialty engineering expertise, knowledge, and services to the surveillance product teams. It maps out the future of surveillance systems and the interfaces for consistency with NAS architecture and explores new concepts to meet current and future surveillance needs. It analyzes issues within the NAS that cross product team boundaries and offers resolutions. It also provides engineering support to product team issues as needed.

Objectives

Configuration Management- On Line

Black vulture bird deterrence device

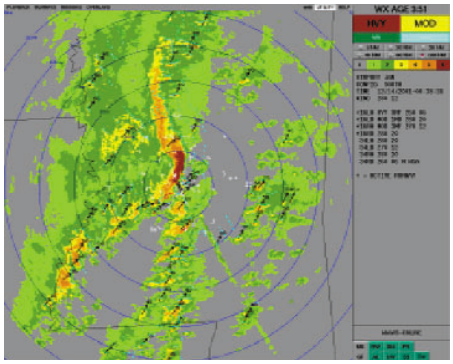
Bird Deterrence Device under testing at the Gainsville, Florida Bird Research Station

Environmental Landscaping at the Terminal Doppler Weather Radar site at JFK-LGA Airport, New York

- Develop and refine a concept for the use of downlinked aircraft parameters and for networking surveillance data.
- Develop a process for the generation of information systems security documentation.
- Develop surveillance and weather system roadmaps based on NAS architecture and concepts of operation.
- Conduct analyses and studies and recommend resolution in support of specific product team issues and needs.

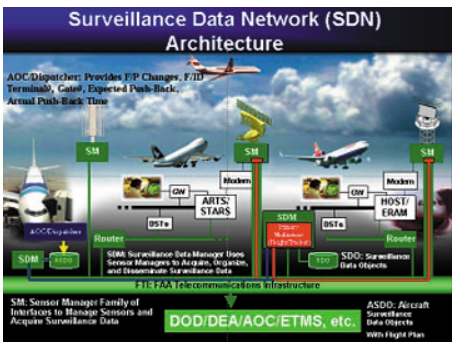
Accomplishments

- Analyzed potential NEXRAD inputs to the MIAWS, determining which sites were suitable for multiple sensor inputs given locations and natural and cultural aspects of the intervening landscape for 36 candidate airports.
- Modeled and simulated NEXRAD estimated reflectivity detection performance. Prepared and delivered reports for 36 candidate airports illustrating NEXRAD detection performance and coverage potential and providing analysis addressing the extent of that coverage.
- Analyzed and provided reports on surveillance radar weather products and displays, including weather products displayed, update rate of the products, thresholds, modifications of products before display, reflectivity level of the display (dBZ, color or gray scale), calibration of the reflectivity channel, methods (manual/auto), frequency, reflectivity channel monitoring, and certification criteria, that are of particular interest to air traffic controllers for the ARSR-1/-2/-3/-4, FPS, ASR-8/-9/-11 radars and the WSP on the ASR-9.



Weather Display for Medium Intensity Airports

- Developed a simulation to model the ASR-11 transition-range time sidelobe responses against near-range clutter, employing transmit modulation and compression filters consistent with those for the ASR-11, and accounting for transmitter effects such as instability sidebands and pre-compression filters. Developed and delivered a report on *The Investigation of the ASR-11 Phantom Clutter Phenomenon.*
- Examined the ASR-11 Primary Surveillance Radar point-clutter constant-false-alarm-rate processing functions.
- Developed simulation software for analysis to lend greater understanding to the mechanisms underlying point clutter, the processing of which takes advantage of the fixed nature of much ground clutter to isolate the larger clutter points from the surrounding regions of lower ground return levels, and to demonstrate its affect on radar performance. Developed a report on *The Analysis of ASR-11 Point Clutter Processing Performance Against Ground Clutter.*
- Developed a White Paper addressing Aircraft Derived Data Extraction (ADDE) program issues focusing on two specific ADDE areas of concern for the down link of additional parameters: the potential for over-interrogation of ground transmitters, and power interference mitigation strategies and appropriate power level settings.

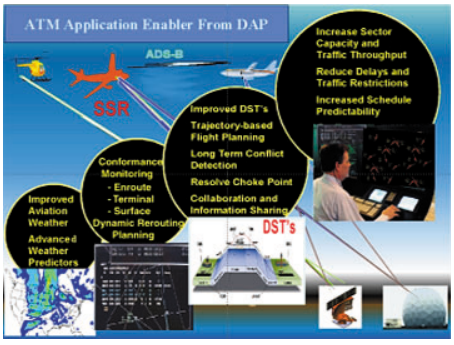


Surveillance Data Network Architecture

- Reviewed the need for and benefits of adding selective interrogation capability to the ASR-11. Developed an ASR-11 Secondary Alternatives' Performance Comparison test plan and performed beacon performance comparison testing at the FAA Technical Center's ASR-9 and Elwood facilities and analyzed results.
- Produced a summary of ASR-11 selective interrogation upgrade benefits to air traffic controllers at high-density airports. Drafted specification modifications for the ASR-11 for a selective interrogation upgrade.
- Examined the features of surveillance radar weather channels, including perform-

ance characteristics, description of scanning strategies, velocity and reflectivity estimates, digital signal processing architecture and algorithms, and ground clutter filtering. Developed reports describing an overview of these characteristics for the ARSR-1/-2, FPS, and ASR-9/-11.

- Completed the TDWR Retrofit effort for AND-420.
- Completed the draft Weather Sensor Roadmap. Developed a preliminary definition and outline of the activities for development of the Weather Surveillance Roadmap Report.
- Completed the Risk Assessment, Risk Mitigation, and Contingency Disaster Recovery Plan for the ASR-11 per the AND-1 schedule. Continuing to develop other parts of the required Security Certification and Authorization Package (SCAP).
- Provided Information Security expertise in the form of reviewing SCAPs and providing information concerning best practices in the field.
- Completed the interface requirements documentation on All-purpose Structural Eurocontrol Radar Information Exchange (ASTERIX). Reviewed surveillance related interface requirements and interface control document as changes occurred.
- Continued development of the enhanced surveillance ++ concept. Finalized the white paper addressing the feasibility of the Enhanced Surveillance ++ program concept as a means of monitoring and displaying the location of ground vehicles to Air Traffic Controllers and submitted it for review.
- Compared current and planned surveillance system capabilities with documented controller and pilot needs and recommended approaches to addressing shortfalls (published as the Surveillance Roadmap)
- Completed the Phase I of the ASDE-3 Multi-static Experiment at BWI with specially designed instrumentation to assess the efficacy of deploying one or more additional receivers with the ASDE-3 to reduce the incidence of false targets due to multi-path signals.
- Analyzed special Aircraft Communications Addressing and Reporting System (ACARS) data messages from an air carrier to assess the benefits of Downlinked Aircraft Parameters for improving performance of the Enhanced Traffic Management System at the System Command Center — specifically, for reducing rates of false monitor alerts and improving estimated waypoint arrival times.
- Investigating the efficacy of employing Downlinked Aircraft Parameters based on the Mode S Ground Initiated Communication, Mode B mechanism as an effective means for the transfer of aircraft weather data to ground stations.
- Surveyed aircraft multilateration surveillance systems inside and outside the U.S. with respect to location, sponsoring agency, equipment vendor and technical characteristics.
- Determined the feasibility of employing ADS-B for surveillance of high-altitude aircraft over the Gulf of Mexico.
- Prepared the Interface Requirements Document for the link between secondary radar sites and En Route Automation Modernization that carries Downlinked Aircraft Parameters.
- Developed a SCAP for the LLWAS.
- Initiated a comparison of aviation weather sensors with operational needs.
- Prototyped phase 1 of an operational demonstration system of a surveillance data network including models of a surveillance data manager and sensor managers (with playback operating as sensor interfaces).



Downlinked Aircraft Parameters

AND–410 Team
(Front L–R) Mara Chan*, Maria Tavenner, Julie Small*, George Beeker*, Pat Ambush*; *(Middle L–R)* Darlene Hart, Kathy Oliver, Ed Gillespie*, Jim Jamitis, Ken Kraus*, Michael Huffman; *(Back L–R)* Rob Davis, Mark Keehan*, Maria DeRosa, Jason Kahara*, Dan Hicok, Peter Barretta

* contractor

AIRPORT SAFETY PRODUCTS

Airport Movement Area Safety System Processor

AIRPORT MOVEMENT AREA SAFETY SYSTEM

Description

The Airport Movement Area Safety System will visually and aurally prompt tower controllers to respond to situations that potentially compromise safety. AMASS is a software and hardware modification to the ASDE-3 radar that provides, to controllers, the alerts and warnings of situations that potentially could result in an accident. AMASS extends the capability of the ASDE-3 and enhances surface movement safety.

Objectives

- To declare Initial Operational Capability (IOC) and start the pre-commissioning Operational Suitability Demonstration (OSD) at 14 sites.
- To successfully complete the field test and accept AMASS Software Build 5, which addresses human factors and Independent Operational Test & Evaluation (IOT&E) issues.
- To successfully complete the Critical Design Review (CDR) of the Houston (IAH) Mosaic Modification.

Accomplishments:

- Commissioned 15 AMASS systems: SLC, SEA, ORD, STL, BOS, MIA, EWR, JFK, ATL, PDX, PIT, CVG, SDF, PHL, and MEM.
- Declared IOC and started the pre-commissioning OSD at 6 additional sites: MSP, MCI, MSY, SAN, LAS, and BWI.
- ATQ-1 delivered a favorable AMASS IOT&E follow-up assessment. (12/01)
- Approved the design of the IAH Mosaic Configuration, based on the CDR. (3/02)
- Signed the contract modification for AMASS Software Build 6, which includes the modifications for the Runway Status Lights R&D effort. (6/02)
- Completed all 37 operational systems audio amplifier and computer front access modifications. (8/02)
- Installed AMASS Software Build 5 in 9 systems: DEN #1, DEN #2, ANC, DFW #1, DFW #2, LGA, IAD, CLT, and ADW.

AIRPORT SURFACE DETECTION EQUIPMENT – MODEL 3

Description

The Airport Surface Detection Equipment – Model 3 provides radar surveillance of aircraft and airport surface vehicles at high activity airports. Radar monitoring of airport surface operations is required to aid in the orderly movement of aircraft and ground vehicles on the airport surface, especially during periods of low visibility, such as rain, fog and night operations.

Objectives

- To deliver an 80/20 cost estimate report for obsolete parts projected out for 6 years.
- To begin construction of the ASDE-3 remote tower site at Reagan National Airport (DCA).
- To let a contract to replace the ASDE-3 Power Supply/Assembly Modulator as part of the ASDE-3 Service Life Extension Program (SLEP) effort.

Accomplishments

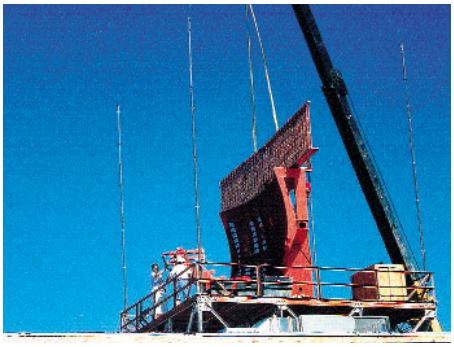
- Completed the Finding of No Significant Impact/Record of Decision (FONSI/ROD) and the final environmental assessment for the DCA ASDE-3 remote tower site. (11/01)
- Successfully completed the final testing of the redesigned microbucket to mitigate parts obsolescence issue. (3/02)
- Delivered a cost estimate report for obsolete parts projected out 6 years. (3/02)
- Completed the foundation and tower construction for the DCA remote site (8/02)
- Signed contract to replace the ASDE-3 Power Supply/Assembly Modulator. (9/02)
- Installed the ASDE-3 antenna and rotodome on the DCA remote tower. (9/02)

Airport surface detection equipment – Model 3 radar antenna

AND–420 Team
(Front L–R) Ted Weyrauch, Cynthia Adamskyj, Bill Syptak, Tom Jenkins, Clay Tauzin; *(Back L–R)* Jennifer Lagana, Joey Purcell*, John Farr, Butch Quallich
(Not Pictured) Irene Langweil, Carmela Vaccarella, Stew Gibb, Bill Goodchild, Steve Shema, Tom Kays, Paulette Thompson*, Bill Harkey*, Bill Parham*, Dale Work*, Joe Main*, Bill Bumgarner*, Andrea Gorra*, Cam Tidwell*, Dan Hedenberg*

* contractor

SURVEILLANCE & WEATHER INTEGRATED SERVICES



Airport Surveillance Radar (ASR-9)

AIRPORT SURVEILLANCE RADAR – MODEL 9

Description

The Airport Surveillance Radar – Model 9 provides enhanced airport surveillance radar with features that support flight safety and improve system reliability and maintainability. It provides state-of-the-art radar service at high-density airports. The ASR-9 and accompanying Leapfrog effort will replace all of the tube-o-type ASR-4/-5/-6 radars with ASR-/-8/-9 radars to reduce the maintenance workload.

Objectives

- To commission the Palm Springs, CA ASR-9.
- To award a Technical Analysis Contract for the ASR-9 SLEP.
- To complete 110 of the 133 reinforcement kit installations at ASR-9 sites.
- To deliver and install the Transportable ASR-9 (TASR) at Columbia.
- To initiate OSHA modifications at ASR-9 sites.

Accomplishments

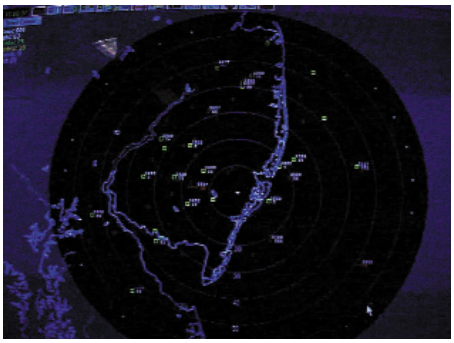
- Awarded a Technical Analysis Contract with Northrop Grumman for the ASR-9 SLEP effort. (12/01)
- The Remote SCIP Emulator (RSE) was installed and tested at Potomac TRACON and nine radar sites to facilitate planned ARTS IIIE testing with all radars. (12/01)
- Commissioned the Palm Springs, CA ASR-9. (4/02)
- Exercised option on the Northrop Grumman contract for the Proof of Concept Design (PODS) for the ASR-9 SLEP effort. (6/02)
- Delivered and installed the TASR at Columbia. (8/02)
- The RSE has successfully met its goals for Regression Testing at the Potomac TRACON. Critical Program Trouble Reports (PTRs) were either signed off on or work-arounds are in place. (8/02)
- Completed all installations of the antenna box beam and jack screw reinforcement kit fixes at 133 ASR-9 sites. This was completed ahead of schedule and under budget. (9/02)
- Completed OSHA modification at fifteen ASR-9 sites. (9/02)

MODE SELECT RADAR

Description
The Mode Select Radar replaces the existing Air Traffic Control Radar Beacon System (ATCRBS) providing enhanced surveillance information for use by air traffic control automation. The Mode S provides more accurate position information and minimizes interference by discreet interrogation of each aircraft.

Objectives
- To complete 68040 national upgrades installations at 50 sites.

Accomplishments
- Completed 51 68040 national upgrades. (9/02)


Mode Select Radar Display

TERMINAL DOPPLER WEATHER RADAR

Description
The Terminal Doppler Weather Radar provides increased safety measures and improved runway/airfield management through detection and display of microbursts, gust fronts, prediction of wind shifts, and precipitation. The advanced notice of changing wind conditions permits the timely redirection of air traffic flow.

Objectives
- To continue to work with the New York and Chicago-Midway TDWR sites to achieve commissioning of these last two systems in FY 2002.
- Initiate a SLEP program for the TDWR program.

Accomplishments
- Presented TDWR SLEP concept to the NAS sustainment board. (1/02)
- A contract was awarded to Datron to engineer First Article equipment for the bearing, gearboxes, and lubrication stations. (7/02)
- Completed engineering work for the Direct Digital Controller (DDC). (9/02)
- Commissioned one TDWR system at Chicago-Midway, for a total of 44 out of 45 operational systems. (9/02)
- Completed a total of 38 TDWR Radar Product Generator (RPG) installs for a total of 41 out of 45 sites.
- Completed a total of 14 backup communication modifications for a total of 14 out of 47 sites.


Terminal Doppler Weather Radar

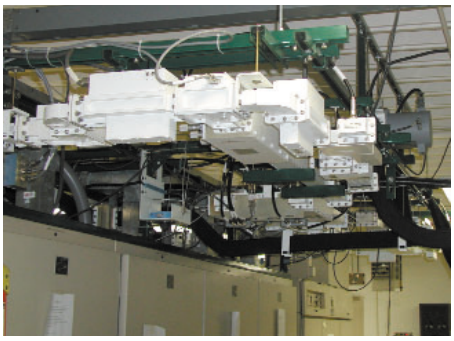
WEATHER SYSTEMS PROCESSOR

Description
The Weather Systems Processor improves safety by warning controllers and pilots of hazardous wind shear and microburst events near runways. The WSP will correct a deficiency in detecting hazardous weather on the ASR-9 weather channel while improving the capabilities in the air traffic control tower on the terminal approach control hazardous weather display.

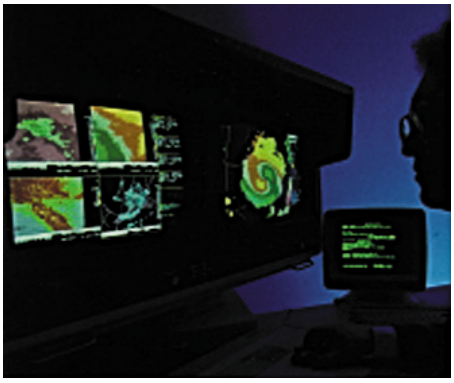
Objectives
- To commission first key site.
- To deliver 13 WSP full production systems for a total of 26 systems.

Accomplishments
- Completed operational testing. (12/01)
- Commissioned the first WSP key site at Austin, TX. (8/02)
- Delivered 16 WSP full production systems for a total of 29. (9/02)

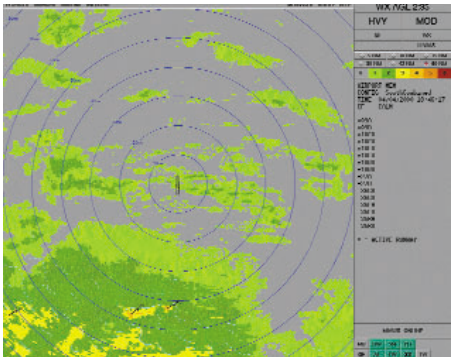

Weather Systems Processor Antenna



Weather Systems Processor



Next Generation Radar Terminal



Next Generation Radar Display

Low Level Windshear Alert System Antenna

NEXT GENERATION RADAR

Description

The Next Generation Radar provides a national network of Doppler weather radars to detect, process, distribute, and display hazardous and routine weather information for use by the Department of Transportation, the Department of Commerce and the Department of Defense.

Objectives

- To complete Remote Monitoring System (RMS) installations.
- To complete Open Radar Product Generator (ORPG) deployment.

Accomplishments

- Installed 5 Rotary Motor Generators (50KVA) and 2 retrofit panels.
- Completed RMS installations. (5/02)
- Completed the ORPG deployment. (7/02)

MEDIUM INTENSITY AIRPORT WEATHER SYSTEM

Description

The Medium Intensity Airport Weather System provides an inexpensive real-time weather display of storm motions and estimated storm tracks to the Air Traffic community using existing NEXRAD product data. MIAWS will be utilized at airports with insufficient operations to justify the presence of TDWR or WSP.

Objectives

- To install prototypes at key test sites.

Accomplishments

- Installed prototypes at Springfield, IL and Little Rock, AK. (7/02)
- Installed two software upgrades to improve products from NEXRAD.

LOW LEVEL WINDSHEAR ALERT SYSTEM

Description

The Low Level Windshear Alert System consists of a network of anemometers (wind sensors) which are strategically located in and around the vicinity of an airport to detect wind shear and microburst events. Once the system detects a wind shear or microburst, warnings are presented to controllers who relay the messages to pilots approaching or departing the airport. The LLWAS program consists of four projects: LLWAS – Network Expansion Upgrade, LLWAS Pole Relocation, LLWAS Sustainment and the LLWAS Disposal and Decommissioning.

Objectives

- To commission fist key site.
- To receive a favorable ISD.

Accomplishments

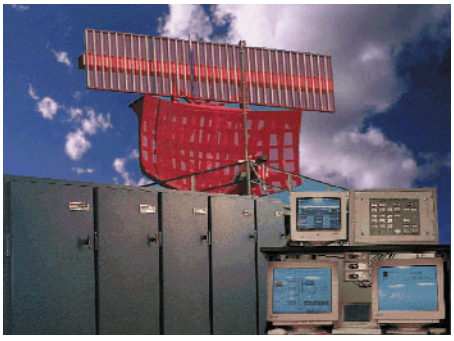
- Completed Operational Testing & Evaluation (OT&E). (2/02)
- Received a favorable ISD for deployment and installation of the LLWAS-RS. (4/02)
- Commissioned first site at Ft. Myers, FL. (8/02)
- Completed LLWAS SCAP package. (9/02)

AND–440 Team
(Front L–R) Pamela Maxwell, Elaine Kallio*, Diana Christie, Julie Small*, Cecily Nabors*, Barbara Kratz; *(Back L–R)* Jim Linney, Vincent Capezzuto, Michael Polchert, Michael McNeill, Mike Nostheide*, Bill Reytar

* contractor

TERMINAL SURVEILLANCE

AIRPORT SURVEILLANCE RADAR – MODEL 11



Airport Surveillance Radar – Model 11 (ASR-11)

Description

The ASR-11 system is a new digital terminal air traffic control radar system that will replace current aging ASR-7, ASR-8, and AN/GPN-12, 20, and 27 analog radars at low to medium density airports. The ASR-11 system is an integrated system consisting of a primary surveillance radar with weather channels, and a monopulse secondary surveillance radar. ASR-11 will improve performance, detection in weather, reliability, reduce maintenance cost, and provide digital data to new automation systems.

Objectives

- Complete regression testing of production engineering change proposals (ECP).
- Complete OT&E.
- Deliver and install training system at Oklahoma City, OK.
- Complete construction and installation of ASR-11 at Boise, ID; Fresno, CA; Willow Grove, PA; and Anchorage, AK.
- Start Construction of ASR-11 at Lincoln, NE; Erie, PA; Fairbanks, AK; Merced, CA; Macon, GA; Melbourne, FL; and Vero Beach, FL.

Accomplishments

- Completed Regression Testing of Production ECP.
- Began OT&E at Willow Grove, PA and Stockton, CA. (key sites)
- Completed construction and installation of ASR-11 at Willow Grove, PA and Stockton, CA. (key sites).
- Initiated construction and installation of ASR-11 at Lincoln, NE; Erie, PA; Boise, ID; Fresno, CA; Anchorage, AK; West Palm Beach, FL; Billings, MT; Akron, OH; Burlington, VT; Lafayette, LA; Springfield, MO; Waco, TX; and Muskegon, MI.
- Procured 3 systems.

Surface Movement Radar antenna located on ATCT cab
Milwaukee, WI

Multilateration Remote Unit and antenna
Milwaukee, WI

AIRPORT SURFACE DETECTION EQUIPMENT – MODEL X

Description

ASDE-X is a modular surface surveillance system capable of processing radar, multilateration, and Automatic Dependent Surveillance-Broadcast (ADS-B) sensor data providing seamless airport surface surveillance to air traffic controllers. ASDE-X was designed for second tier airports and as a Product Improvement / Upgrade for ASDE-3 (AMASS) airports. The ASDE-X system depicts aircraft vehicle position and identification information overlaid on a color map showing the surface movement area and arrival corridors during inclement weather conditions. The FAA will be deploying 25 new ASDE-X systems, 8 ASDE-X Product Improvements /Upgrades at ASDE-3 sites, and 4 ASDE-X support systems.

Objectives

- Obtain Joint Review Council (JRC) approval for ASDE-X Product Improvements/Upgrade ASDE-3 sites with multilateration/ADS-B.
- Complete key site installation at Milwaukee, WI (MKE).

ACCOMPLISHMENTS

- Completed software coding and integration for first article system. (4/02)
- Obtained JRC Approval for ASDE-X Product Improvements / Upgrade ASDE-3 Sites with multilateration/ADS-B. (6/02)
- Conducted ASDE-3 interface system requirements review. (7/02)
- Completed SMR Installation at Orlando. (8/02)
- Completed key site installation at MKE. (9/02)

AND–450 Team
(Front L–R) Milton Ryan, George Brown, Nicole Pritchard, Mamta Puri*, Caroline DiManna, Melanie Turner*, Tina Griffin*, Paula Poppy*;
(Middle L–R) Kirk Curran*, Sy Karlin, Tom DeFranco*, Scott Schlegel, Dave Middledorf*, Defense Lalwang, Joe DeChristopher, Gavin Byrne*;
(Back L–R) Dick Morgan*, Mike Wieler, Jim Pette, Hal Gielow*, Larry Taubenkibel, Anthony Coggins, John Davis*
(Not Pictured) Bashar Halabi, William McGovern, Karen Dove*, Kim Jaroneski, Sheryl Mears, Don Taylor

* contractor

EN ROUTE SURVEILLANCE

AIR TRAFFIC CONTROL BEACON INTERROGATOR – MODEL 6

Description

The Air Traffic Control Beacon Interrogator – Model 6 program will upgrade the outdated 30-year old existing beacon radar systems with current technology equipment, and will be the third and last phase of the NAS field implementation of secondary surveillance radar system upgrades. The ATCBI-6 systems will be state-of-the-art monopulse secondary surveillance radar with Mode S discrete addressing capabilities.

Objectives

- Procure 36 ATCBI-6 Systems.
- Deliver 17 ATCBI-6 systems to sites.
- Commission First ATCBI-6 system at Key-Site, Tinker AFB, OK.
- Commission First Production System (FPS) at Putnam, OK.
- Complete development of NAS Infrastructure Management System (NIMS) proxy agent for FPS, ARSR 1/2 and BOS radars.
- Complete Delta Test Readiness Review number 3 (TRR3a) FCA/PCA.
- Achieve First IOC.
- Achieve Operational Readiness Demo (ORD).
- Obtain ISD.

Accomplishments

- Procured remaining Monopulse Beacon Test Sets (1/02).
- Completed Preliminary Design Review (PDR) for Mode 4 Interface. (1/02)
- Completed Information System Security (ISS) Testing. (4/02)
- Completed development of NIMS proxy agent for FPS and ARSR 1/2 radars. (4/02)
- Completed System Baseline Review II (SBR II). (5/02)
- Completed CDR on the Mode 4 Configuration. (6/02)
- Achieved First IOC. (6/02)
- Achieved First ORD. (6/02)
- Received favorable ISD. (6/02)
- Procured 36 ATCBI-6 Systems. (6/02)
- Completed Test for the Monopulse Beacon Test Set (MBTS) Interface. (7/02)

Air Traffic Control Beacon Interrogator – Model 6

- Commissioned First ATCBI-6 system at Tinker, AFB. (7/02)
- Delivered 17 ATCBI-6 systems to sites. (9/02)
- ATCBI-6 Team won the ARA Business Excellence Award.
- ATCBI-6 Team won the ARA Implementation Team Award.

ALASKA RADAR UPGRADES (OX-60)

Description

The FAA is providing funding and technical expertise to the US Air Force (USAF) to procure, install and test a monopulse Secondary Surveillance Radar Beacon replacement system at twelve Minimally Attended Radar (MAR) facilities in Alaska. These USAF systems are used by the FAA for air traffic control in the region. This system will be capable of interrogating aircraft equipped with ATCRBS or Mode S transponders. The first article will be installed at Murphy Dome, AK, and after successful completion of appropriate testing, will be used in an operational environment.

Objectives

- Obtain Joint Production Decision and provide funding for FAA "Share" of Production Systems.
- Gain FAA Commitment for Joint Testing Program.
- Validate Requirements and Obtain Funding for Mode-S Upgrade Option.

Accomplishments

- Signed a Modification to the Memorandum of Agreement between the FAA and U.S. Air Force. (12/01)
- Established Contractor System Integration Testing (SIT) Program. (12/01)
- Initiated Subcontractor Performance Monitoring Plan to Resolve Design Discrepancies and Reduce Schedule Delays. (5/02)
- Validated Mode-S Upgrade Requirement. (9/02)

Long Range Radar

LONG RANGE RADAR (LRR)

Description

The LRR Improvement Program is an essential component for sustaining/upgrading the current primary en route radar systems, infrastructure, and facilities to continue providing air traffic control services as described in the NAS architecture. The key program segments are: Take-down of systems (ARSR-1/-2/-3, FPS) that have been replaced by ARSR-4; facility infrastructure and system upgrades required to sustain long range radars; and implementation of the Radio Frequency Interference (RFI) Modification to protect long range, primary radars from interference and damage that may result due to the loss of frequency spectrum.

Objectives

- Complete Upgrades at 10 Sites. (ARA Goal)
- Complete Installation of RFI Modification Kits at 18 ARSR-4 sites and 1 ARSR-1 site.
- Complete Investment Analysis and Obtain JRC-2A Investment Decision for the LRR Restructuring Plan.
- Initiate ARSR-1/-2/-4 and FPS Engineering Studies.
- Develop ARSR-4 Lightning, Grounding, Bonding, and Shielding (LGBS) System Solution.
- Complete Infrastructure Upgrade Site surveys at 20 sites.
- Commence regional surveys for future infrastructure upgrades.
- Generate Action Plan for Equipment Removal Alternative at Crescent City, CA.

Accomplishments

- Assisted in the Formulation of FAA Requirements and Potential Alternatives for Long Range Primary Radar to support Homeland Security. (4/02)
- Completed the RFI Modification at the final ARSR-1 site. (6/02)
- Participated in the Development of a National Surveillance Plan. (6/02)
- Finalized Design for LGBS System Upgrades to Comply with FAA-STD-019D at ARSR-4 Facilities. (7/02)
- Successfully removed the ARSR-3 Assets from the Cross City, FL Site. (7/02)
- Conducted Engineering Studies and Analyses of ARSR-1/-2/-4, and FPS Legacy Long Range, Primary Radars. (8/02)
- Completed Infrastructure Upgrades at 25 LRR Facilities. (9/02)
- Successfully Completed 26 ARSR-4 RFI Modifications. (9/02)
- Due to the Events of September 11, 2001, the LRR Restructuring Plan Activities were placed on hold and an Interagency Workgroup was formed. (9/02)

PRECISION RUNWAY MONITOR

Description

The Precision Runway Monitor system contributes to the FAA's system efficiency goal by increasing the number of aircraft that can perform simultaneous independent approaches at an airport for landing in adverse weather conditions. There are air traffic control restrictions on allowing aircraft to fly side by side as they approach closely-spaced parallel runways. These restrictions primarily affect aircraft during limited visibility conditions. PRM technology enables simultaneous independent approaches to runways closer than 4,300 feet by utilizing a high-speed radar that provides a one-second update of aircraft position information (vice 4.8 seconds for a conventional airport surveillance radar), which increases the number of aircraft that can be handled during adverse weather conditions thus effectively minimizing lost capacity at the airport.

Precision Runway Monitor

Objectives

- Develop PRM Acquisition Program Baseline (APB).
- Complete PRM system integration & calibration at San Francisco International Airport (SFO).
- Complete site construction at John F. Kennedy International Airport (JFK).
- Install antenna dipole heater modification in PRM systems.
- Complete STARS to PRM functional interface testing.
- Obtain Senior Management decision on PRM system upgrade to Type C configuration to mitigate parts obsolescence and system design deficiencies.
- Develop and implement ARTS IIIE to PRM interface at Minneapolis-St. Paul International Airport (MSP) and Lambert-St. Louis International Airport (STL).
- Complete Contractor Acceptance Inspection (CAI) at SFO.

Accomplishments

- Completed San Francisco PRM system integration & calibration. (10/01)
- Obtained approved PRM APB. (12/01)
- National agreement with National Air Traffic Controllers Association (NATCA) approved. (12/01)
- Installed antenna dipole heater modification in all PRM systems. (12/01)
- Awarded training contract modification and completed 2 off-site hardware maintenance training courses. (2/02)

- Completed JFK PRM site construction. (2/02)
- Completed Phase IV testing at SFO. (5/02)
- Completed CAI and custodial Joint Acceptance Inspection at SFO. (6/02)
- Awarded contract modification to upgrade System 6 to type C configuration. (6/02)
- Relocated and installed SFO PRM equipment from San Francisco Bay TRACON to Northern California TRACON. (7/02)
- Developed and implemented ARTS IIIE to PRM Interface at MSP, STL, SFO, and JFK. (9/02)

Buoy Communications System buoy

GULF OF MEXICO PROGRAM

Description

The Gulf of Mexico Program was directed at expanding the current inadequate or non-existent communications, navigation, surveillance, weather and automation coverage in the en route and offshore areas of the Gulf of Mexico. The GOMP focused on expanding direct controller-pilot VHF radio communications through a combination of the VHF Extended Range Network (VERN) and the Buoy Communications System (BCS), which would have provided coverage over the oceanic Flight Information Region (FIR) from 18,000 feet and above. VERN is a high-powered VHF communications suite comprised of 4 land-based sites. BCS is a marine based communications suite comprised of multiple buoys moored in the Gulf of Mexico. The complement of these two systems would have fulfilled the required communications need for en route and offshore air traffic throughout the Houston Oceanic Flight Information Region.

Objectives

- Complete VERN transition to AOP-1000 for in-service management.
- Make a decision on VHF Radio solutions.
- Complete construction on second production communications buoy.
- Develop BCS Remote Maintenance Monitoring Capability (RMMC) to Maintenance Processing System (MPS) interface requirements.
- Initiate Factory Acceptance Testing (FAT).
- Senior management to make decision on BCS program direction.

Accomplishments

- Completed the BCS Provisioning Conference. (10/01)
- Completed BCS VHF radio decision. (10/01)
- Implemented the BCS Program Assessment & VHF radio solutions. (10/01)
- Completed transition of VERN to AOP-1000, In-Service Management, Contract Maintenance Office. (11/01)
- Completed VERN ISD. (11/01)
- Completed environmental testing of WaveTalk system. (11/01)
- Developed the BCS RMMC to MPS interface requirements. (12/01)
- Completed Phase I facility upgrades at Houston BCS RMMC. (1/02)
- Completed construction on second production buoy. (1/02)
- Initiated formal FAT. (1/02)
- Completed BCS radio certification software development. (1/02)
- Briefed National Air Traffic Controllers Article 7. (2/02)
- FAA management directed program cancellation due to numerous technical and programmatic difficulties. (7/02)

AND–500 Front Office Staff
(Front L–R) Cheryl Emerson Adams, Dave Ford, John Loynes, Connie Brown;
(Back L–R) Tara Carr, Ken Leonard, Steve Ritchey, Bob Schramm

SAFE FLIGHT 21 AND SURFACE TECHNOLOGY ASSESSMENT INTEGRATED PRODUCT TEAM

Mission Statement

The Safe Flight 21 (SF-21) and Surface Technology Assessment Integrated Product Team supports the FAA through research, development and limited implementation efforts aimed at enhancing the safety, efficiency, and capacity of the NAS. The team's goal is to "incubate and exploit technologies and expedite the deployment of operationally validated NAS capabilities for the aviation community."

Product Team Structure

The SF-21 and Surface Technology Assessment Integrated Product Team consists of two product teams, which are each responsible for demonstrating and evaluating new and emerging technologies.

The SF-21 Product Team is exploring the use of ADS-B, broadcast services, and other technologies in order to provide common, real-time traffic information to both air traffic controllers and flight crews. The team also supports the development of standards related to the use of such technologies in the NAS.

The Surface Technology Assessment Product Team is exploring a range of technologies with potential application to the airport surface in order to increase pilot situational awareness and enhance runway safety. The team works closely with the FAA Office of Runway Safety and other FAA stakeholders to develop runway safety application prototypes and demonstrate their functionality and potential effectiveness in operational settings. Current program initiatives include the development of a runway status lights (RWSL) system to provide pilots with a visual cue for identifying runways that are unsafe for entry. Additional research and development is being directed at other pilot aids, including ground marker and flashing Precision Approach Path Indicator (PAPI).

In addition, AND-500 is undertaking several special projects, including the Global Communications, Navigation and Surveillance System (GCNSS) program, a research and development program to explore the role of a satellite-based communications, navigation and surveillance (CNS) capability in the NAS; and the AIR-21 Cost Sharing Airport program, a set of cooperative, cost sharing projects between airports and the FAA to procure, install, operate, and maintain NAS systems and equipment.

Boeing IIF GPS satellite constellation

The Product Teams and their programs are as follows:

SAFE FLIGHT 21

Ohio River Valley Product Team Lead: Paul Fontaine
Alaska Capstone Product Team Lead: John Hallinan
ADS-B Standards Development: Paul Fontaine

Terminal, surface area and flight safety applications, procedures and equipment that utilize ADS-B, surface moving maps, Traffic Information Services – Broadcast (TIS-B), Flight Information Service – Broadcast (FIS-B), multilateration, and Global Positioning System (GPS) technologies. Establish and maintain test beds in Memphis, TN, Louisville, KY, Frederick, MD, Bethel, AK, and the FAA Technical Center.

SURFACE TECHNOLOGY ASSESSMENT

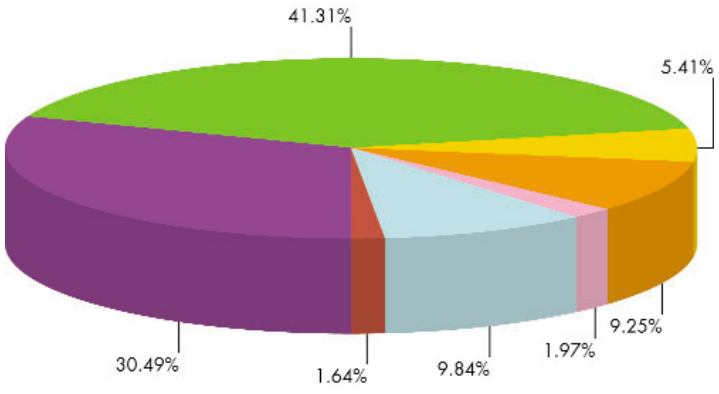
Product Team Lead: Jaime Figueroa

Runway Incursion Reduction Program (RIRP) efforts include: Provide support to Dallas-Ft. Worth (DFW) and Long Beach (LGB) test beds, technology assessment, requirements definition and validation activities associated with RWSL, multilateration surveillance products, and special projects such as Fog Eye, light emitting diodes (LED), and ground markers.

Goals for FY03

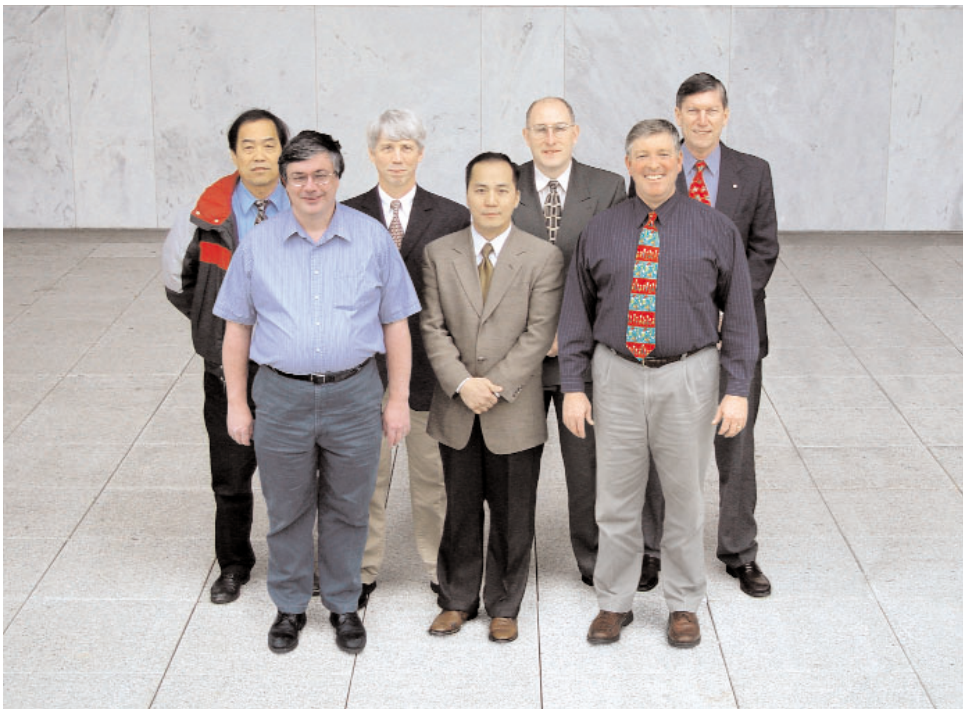
- Develop a vehicle tracking plan for the airport surface at ASDE equipped airports.
- Complete modeling and simulation of satellite communications, navigation, and surveillance air traffic management service capability for reducing separation standards in the Gulf of Mexico.
- Reduce the commercial air carrier fatal accident rate by 35% to .033 per 100,000 departures.
- Submit report to AND-1.

FINANCIAL DATA



FY 01: $49 million

SF-21 Ohio River Valley	$15.5 million
SF-21 Alaska Capstone	$21.0 million
Louisville	$5.0 million
RIRP	$4.7 million
ADS-B Development	$2.8 million
Fog Eye	$1.0 million
Chicago Cost Share	$0.834 million



AND–510 Team
(Front L–R) Charles Sloane, Vincent Nguyen, Robert Nichols; *(Back L–R)* Gene Wong, John Marksteiner, Paul Fontaine, James McDaniel *(Not Pictured)* Toni Stack, Charles Buntin, Jim Hebert, Tom Prevost, Robert Smith

SAFE FLIGHT 21

Description

SF-21 is a joint government/industry cooperative effort to explore the use of ADS-B and other related enabling CNS technologies for improving the safety, efficiency and capacity of the NAS. This is being accomplished through the development, demonstration, and testing of applications, procedures, and equipment in the Ohio River Valley in conjunction with the Cargo Airline Association (CAA), and the Aircraft Owners and Pilots Association (AOPA), and in Alaska via the Capstone initiative.

Objectives

- Expedite emerging surveillance and other related CNS technologies.
- Encourage government and industry joint cooperation in these efforts.
- Develop required standards for appropriate technologies.

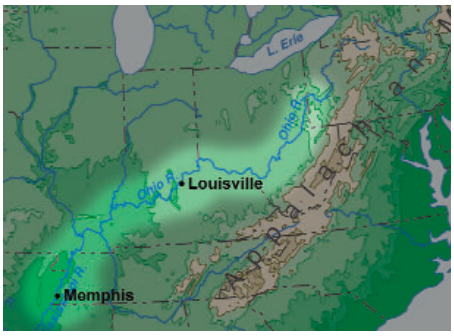
SF-21 Initiatives

Under SF-21, two technology initiatives are being undertaken:

- Ohio River Valley
- Alaska Capstone

Goals for FY03

- Deliver airport surface moving maps for 45 airports and posting them to the website for industry use.



Ohio River Valley Region

Alaska Capstone region

Louisville International Airport, KY

Memphis International Airport, TN

OHIO RIVER VALLEY

Description

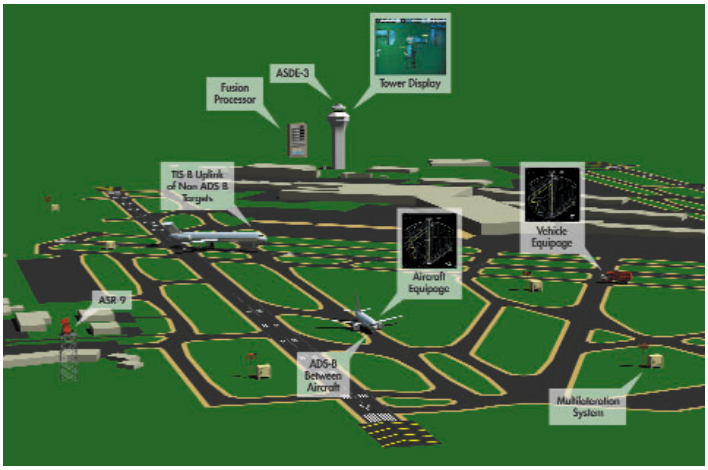
In the Ohio River Valley, SF-21 is undertaking ambitious demonstration and test programs, in coordination with CAA and with AOPA. These programs have been initiated to explore how ADS-B and other new CNS technologies can be used to increase situational awareness and surface safety. These demonstrations and tests will collect and evaluate data for the ground infrastructure, avionics, and procedures needed to enhance surveillance using ADS-B. SF-21 is also conducting ADS-B simulation and modeling activities, providing critical data needed for certification and standards development.

Objectives

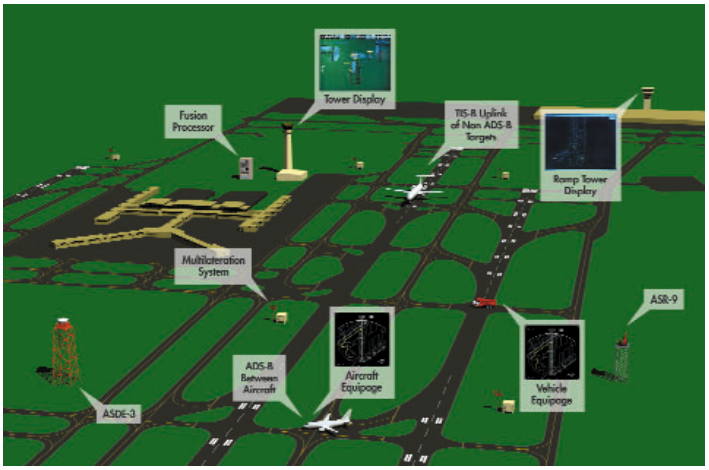
- Demonstrate procedures, equipment, and infrastructure needed to implement ADS-B in the NAS.
- Evaluate terminal and surface domain ADS-B applications that have potential for providing safety, efficiency, and capacity benefits.
- Demonstrate the capability to provide common, real-time traffic information to both air traffic controllers and flight crews.

Accomplishments

- Tested avionics, broadcast services, and vehicle tracking performance (using ADS-B and other technologies) during flight tests in Memphis, TN. (5/02)
- Expanded test bed in Memphis to include wide-area multilateration. (5/02)
- Installed ADS-B technology on ten operational vehicles at Memphis to begin vehicle tracking program. (6/02)
- Established surface traffic management metrics plan. (6/02)
- Conducted simulation to evaluate pilot use and acceptability of ADS-B derived traffic information displayed in the cockpit. (7/02)
- Installed prototype multilateration capability at Louisville. (7/02)
- Published digital surface maps for 33 airports. (9/02)



SF-21 architecture at Memphis International Airport, TN



SF-21 architecture at Louisville International Airport, KY

ALASKA CAPSTONE

Description

The Alaska Capstone program is a joint industry/FAA safety initiative to reduce the high rate of aviation accidents in Alaska by implementing new CNS technologies. The program's primary focus is to improve aviation safety through the introduction of capabilities that improve the pilot's situational awareness about traffic, terrain, and weather. This is done through the incorporation of the appropriate avionics and ground infrastructure.

Objectives

- Reduce aviation accidents, fatalities, and property damage in Alaska.
- Improve aviation safety, capacity, and efficiency in Alaska.
- Meet NAS operational safety and security requirements.

Accomplishments

- Completed installation of Bethel tower display. (6/02)
- Held International Advanced Aviation Technologies Conference (IAATC) on ADS-B technology in conjunction with the Alaska Aviation Coordination Council. (8/02)
- Installed 43 Capstone avionics suites in Part 135 aircraft. (9/02)
- Completed installation of Capstone Phase I ground-based transceivers. (9/02)
- Commissioned final Phase I Capstone Automated Weather Observation System (AWOS). (9/02)

Prototype avionics display showing ADS-B derived traffic information

UPS AT MX-20 display showing terrain on Capstone equipped aircraft

Juneau Airport and Gastineau Channel, Juneau, Alaska

ADS-B/Common Arts Integration

AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST

Description

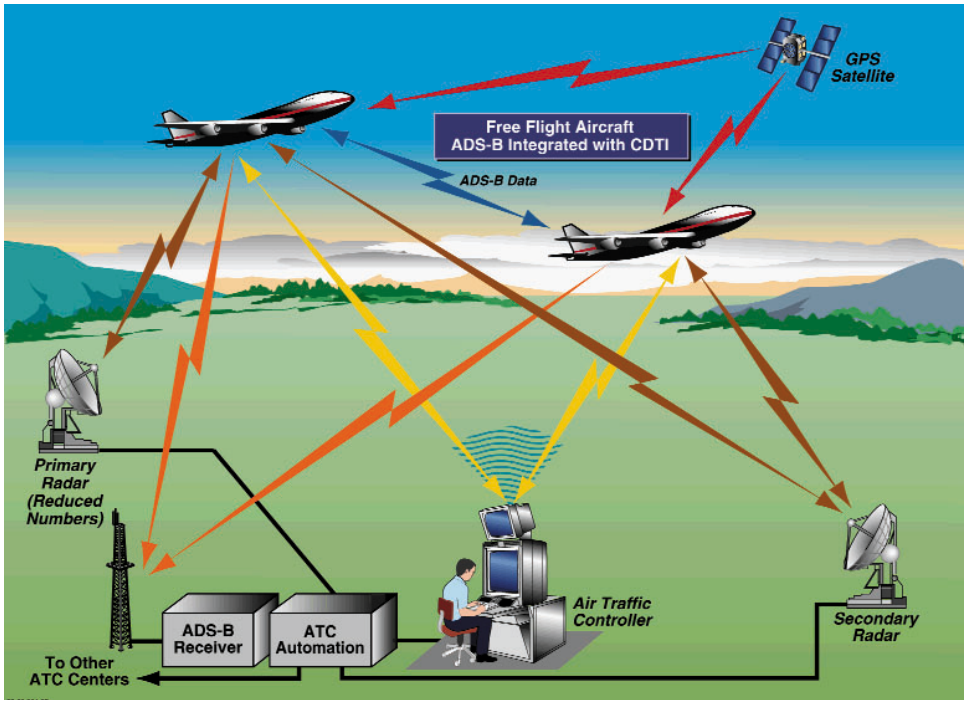
The ADS-B Program is a standards development effort aimed at enabling the use of ADS-B as a surveillance technology to enhance safety and efficiency. This program supports the development of domestic (RTCA) and international ADS-B standards through analysis, simulation, and data collection. It contributes to rulemaking activities and facilitates global ADS-B interoperability. This program also provides for ADS-B planning and coordination.

Objectives

- Develop RTCA ADS-B standards.
- Develop ICAO ADS-B standards.
- Collaborate with EUROCAE and EUROCONTROL in standards development.
- Provide ADS-B surface planning and coordination.

Accomplishments

- Completed ADS-B Minimum Aviation System Performance Standards (MASPS), Revision A. (4/02)
- Completed Universal Access Transceiver (UAT) Minimum Operational Performance Specifications (MOPS). (6/02)
- Contributed to publication of the draft ICAO Airborne Separation Assistance Systems (ASAS) Circular. (9/02)



ADS-B technology at work

AND–520 Team
(Front L–R) Thien Ngo, Son Tran, Jaime Figueroa, Pamela Whitley, Vincent Chu; *(Back L–R)* Michael Hartzog, Kelvin Kercado, Peter Hwoschinsky, Richard Coffelt, Richard Simon

SURFACE TECHNOLOGY ASSESSMENT

Description

This program explores, evaluates, and validates current and emerging technologies that show potential for increasing runway safety in the NAS. Within the scope of this program, evaluation projects are underway to assess the technical and operational suitability of new concepts in surface traffic surveillance, as well as pilot and controller situational awareness tools.

Objectives

- Research and evaluate runway incursion reduction technology solutions.
- Assess solution technical performance and operational effectiveness.
- Recommend solution for NAS implementation.
- Support the FAA Runway Safety Blueprint technology initiatives.

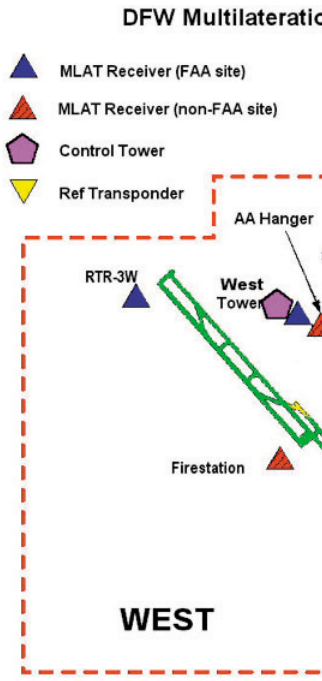
RUNWAY INCURSION REDUCTION PROGRAM INITIATIVES

Several technology evaluation initiatives are underway:

- Runway Status Lights
- Long Beach (LGB) Test Bed
- Dallas-Fort Worth (DFW) Test Bed
- Airport runway incursion technology assessments
- Technology research and demonstration, including ground marker beacons, LED lighting, and laser technology.

Goals for FY03:

- Completing the evaluation of new technologies that reduce the potential for runway incursions, including lasers, light emitting diode lights, flashing PAPI, or other runway occupancy signals.
- Completing RWSL shadow operations testing at DFW and generating a report with recommendations to stakeholders.



Runway Status Lights

RUNWAY STATUS LIGHTS

Description

The RWSL program builds on earlier FAA research and development projects that explored the feasibility and potential operational effectiveness of a surveillance driven automated system of lights. This lighting system would be used to warn pilots and other airport vehicle operators that it is unsafe to enter a runway.

Objectives

- Evaluate RWSL using alternative surveillance data sources.

Accomplishments

- Developed system specification and conducted system design review. (1/02)
- Developed initial Research Management Plan (RMP). (5/02)
- Developed RWSL safety logic for DFW. (6/02)
- Awarded RWSL airfield lighting system contract. (6/02)
- Defined RWSL locations for DFW operational evaluation. (6/02)
- Completed quantitative analysis of RWSL technology for use in cost benefits analysis. (7/02)

Flashing PAPI

LONG BEACH TEST BED

Description

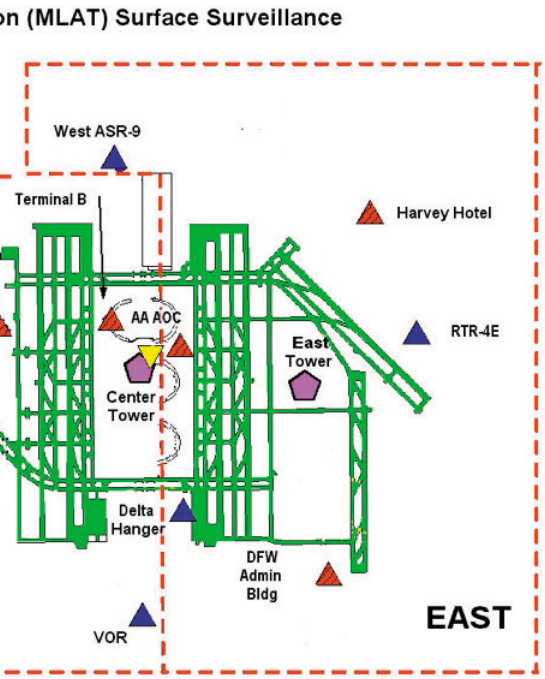
LGB has served as a test facility to evaluate a variety of runway safety applications. Initially outfitted with an array of inductive loops to evaluate alternative surface surveillance concepts, LGB has provided the basic infrastructure upon which other runway safety application have been prototyped and demonstrated. Its mix of aircraft operations and complex airport configuration makes LGB a unique environment for assessing the effectiveness of runway safety technologies for small to medium airports.

Objectives

- Prototype, demonstrate and evaluate various runway safety technology applications with potential use in small to medium airports.

Accomplishments

- Demonstrated loop-driven runway safety lights. (4/02)
- Demonstrated flashing PAPI runway occupancy awareness aid. (9/02)



DFW Airport

DALLAS – FORT WORTH TEST BED

Description

DFW provides an operational environment in which to evaluate the effectiveness of runway safety technologies targeted for large airports. Multilateration surface surveillance technology is a foundational element of the DFW test bed. In collaboration with the DFW Airport Authority and the ASDE-X program, AND-520 has installed and upgraded an airport-wide multilateration system. This system provides surveillance and identification of all transponder-equipped aircraft and vehicles on the airport surface, and serves as a test bed for the integration and evaluation of other runway safety technologies (like RWSL). The DFW system also provides for a common view of the airport surface traffic situation that is being shared with several users at the facility.

Objectives
- Increase surface traffic surveillance capability for airport users.
- Establish and sustain a surface surveillance system and support the development of surface management and runway incursion reduction capabilities (e.g. RWSL and ASDE-X enhancements).

Accomplishments
- Established surface traffic data interface with DFW Airport Authority, American Airlines, and Delta Airlines. (4/02)
- Initiated surface traffic data dissemination with DFW and American Airlines. (6/02)
- Installed ASDE-X/multilateration system. (9/02)

AIRPORT RUNWAY INCURSION TECHNOLOGY ASSESSMENTS

Description
In response to a recommendation form the Department of Transportation's (DOT) Office of the Inspector General, AND-520 was tasked to conduct surveys at high runway incursion airports that are not scheduled to receive an ASDE-3, AMASS, or ASDE-X. The assessments will be used to determine the appropriateness of implementing other technology interventions for addressing runway incursions at these airports.

Objectives
- Review runway incursion causal factors and conduct surveys at 16 specified airports.
- Issue individual survey reports with findings, results, and recommendations.

Accomplishments
- Completed site survey visits at 16 specified airports. (8/02)

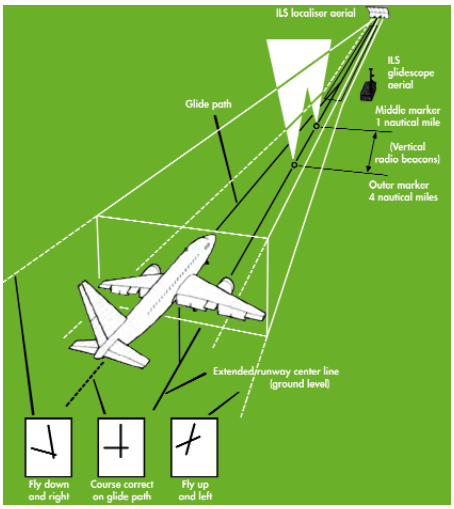
GROUND MARKER

Description
The Ground Marker (GM) concept was developed in response to the Surface Technology Broad Agency Announcement (BAA) released during FY 2000. GM is intended to increase pilot situational awareness by marking the aircraft's position on the airport through cockpit-audible voice messages. GM uses a 75 Mhz marker receiver radio as a communication medium and does not require new avionics for the system to function.

Objectives
- Formulate GM system design.
- Install and evaluate the performance and effectiveness of GM prototype system in an operational setting.

Accomplishments
- Demonstration at FAA Technical Center.(11/01)
- Completed technical proposal for operational evaluation. (9/02)

Ground Marker Concept



ILS Glide Slope concept

LIGHT EMITTING DIODE (LED) LIGHTING

Description

Lighting products that incorporate LED technology have been used in commercial applications for several years. Recently, LED products with potential application in the airport surface have emerged. One such product – LEDLine strips – was demonstrated as part of the FY 2000 Surface Technology BAA. The product showed potential application for increasing the conspicuity of painted markings on the airport surface. AND-520 installed LEDLine strips at Omaha's Eppley Field in a configuration meant to enhance the hold position markings at a selected runway/taxiway intersection. With the addition of microwave motion sensors, the team is able to assess the effectiveness of "just-in-time" alerting concepts.

Objectives

- Evaluate the performance and effectiveness of LEDLine strips in increasing hold position conspicuity.
- Evaluate the performance and effectiveness of sensor activated (just-in-time) alerting concepts.

Accomplishments

- Awarded Omaha system installation contract. (3/02)
- Completed Phase 1 system installation at Omaha. (6/02)
- Initiated operational demonstration. (7/02)

Laser holding position

LASER TECHNOLOGY

Description

The Laser Enhancement Program is designed to emphasize holding position markings by projecting a bright light across the first solid line of the holding position marking. The holding position marking equipment will illuminate a solid "yellow" line across a holding position line at least 75 feet wide when moisture is present due to inclement weather and periods of poor visibility such as fog.

Objectives

- Demonstrate performance and effectiveness of laser technology in enhancing airport surface painted markings in low visibility conditions.
- Support the FAA Runway Safety Blueprint Objective 7.3 technology initiative.

Accomplishments

- Awarded contract. (7/02)
- Developing laser technology demonstration plan. (9/02)

AND–700 Front Office Staff
(Front L–R) Joe Fee, Cynthia Hunter, Karen Miller–Long, Jackie White, Carmen Tarbell, Tom Nagle;
(Back L–R) Dennis Weed, Jack Loewenstein, Harry Kane, Dennis Kolb, Calvin Miles, Jim Rizzolo

NAVIGATION INTEGRATED PRODUCT TEAM

The Navigation IPT is responsible for the procurement and installation of ground based navigational aids and satellite based augmentation systems to provide guidance to aircraft that operate in the NAS. The ground based navigational aids consist of electronic and visual aids to provide aircraft accurate glide angle and alignment with the runway centerline while landing at an airport. There are two satellite systems that are augmentations to the global positioning system. The wide area augmentation system will provide precision guidance to aircraft at thousands of airports and airstrips where there is no precision landing capability. The local area augmentation systems will augment GPS to provide service on approximately a 20 to 30 mile radius of the airport area.

Mission Statement

To meet the needs of our customers and users. We strive to maintain and improve safety and efficiency, through satisfying the needs of FAA goals, the requirements of the operational evolution plan, congressional mandates and other operational needs necessary to sustain and enhance the navigation and landing segment of the NAS.

Integrated Product Team Structure

The Navigation IPT consists of three navigation systems acquisition product teams (PT), one navigation systems implementation product team, and a systems engineering group.

The Product Teams and their programs are as follows:

Navigation IPT
IPT Lead: Jack Loewenstein

Systems Engineering Group
Lead: Joseph Fee
Systems Engineering; Configuration Management; NAS Security; LORAN-C Evaluation Program; Navigation Certification Safety

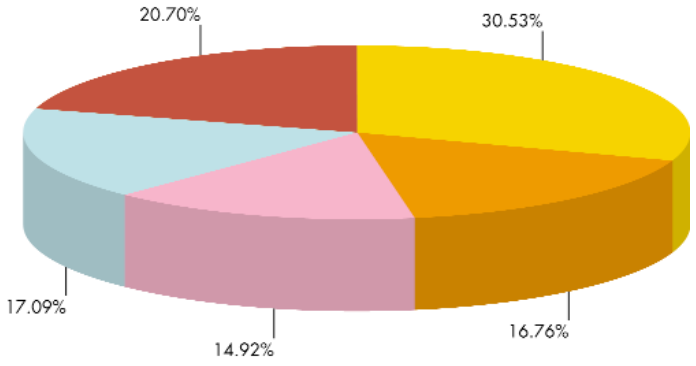
Local Area Augmentation System (LAAS)
PT Lead: Gary Skillicorn
LAAS non-federal and federal versions

Navigation Systems Implementation PT
PT Lead: Manuel Vega
Transponder Landing System (TLS); Airport Partnering Initiative/PAPI Pilot Program; Implementation of other PT products

Wide Area Augmentation System (WAAS) PT
PT Lead: Harold Bell
WAAS and Geostationary Satellites

Navigation and Landing Systems Acquisition PT
PT Lead: Lansine Touré
Instrument Landing System (ILS) establish/replacement; Runway Visual Range (RVR) Establish; Low Power Distance Measuring Program (LPDME); Very High Frequency Omni-Directional Range Finder (VOR); Approach Lighting System with Sequence Flashing Lights (ALSF-2); Medium Intensity Approach lighting System with Runway Alignment Lights (MALSR); PAPI

FINANCIAL DATA



FY02: $271.5 Million

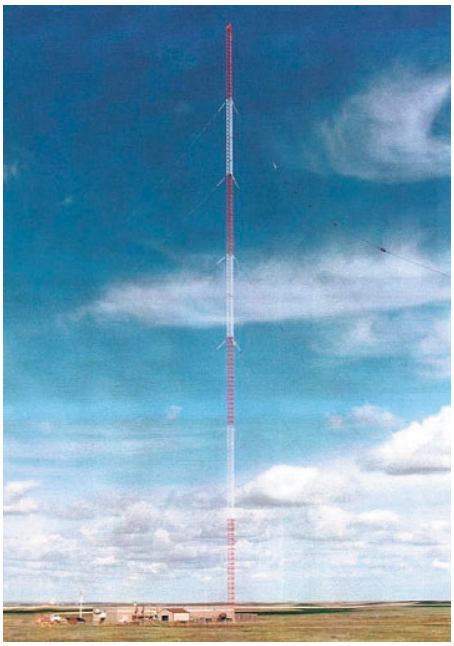
WAAS	$82.9 million
LAAS	$45.5 million
ILS	$40.5 million
ALSIP	$46.4 million
Conventional Electronic Navigation & Landing Aids	$56.2 million

SYSTEMS ENGINEERING GROUP

LORAN-C EVALUATION PROGRAM

Description

The Congressionally mandated Loran-C Evaluation Program is a joint effort with the U.S. Coast Guard to recapitalize the aging Loran-C infrastructure and improve the accuracy, availability, integrity and continuity of the system from the ground-transmission perspective. Loran-C will improve the accuracy, availability, integrity and continuity of the system from the aviation perspective though the use of H-field antennas to eliminate precipitation static (p-static) and all-in-view digital signal processing (DSP) receivers. The effort will determine the data throughput capability of the Loran system and whether it can successfully transmit the 250 bit-per-second WAAS message and the ability to improve and support timing requirements.



Loran-C Antenna

Objectives

- Determine whether Loran can provide RNP .3 navigation capability to aviation to support non-precision approach (NPA) by
  - Determining what improvements to the Loran infrastructure and avionic receivers and antennas are necessary to provide the accuracy, availability, integrity, and continuity required to support NPA and
  - Determining what changes to operating procedures are required to achieve the necessary performance parameters.
- Determine whether Loran can provide the accuracy required to support maritime harbor entrance and approach.
- Determine whether Loran can provide the required timing and frequency accuracies to support the communications and timing communities.
- Determine the ability of Loran to provide a robust navigation and timing back-up in the event of a GPS outage.
- Determine whether the provision of Loran navigation and timing services is cost beneficial.

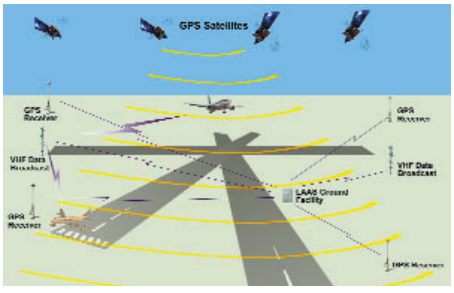
Accomplishments

- Established accuracy, availability, integrity, and continuity requirements for Loran to meet in order for it to support NPA.
- Established a Loran Integrity Performance Panel (LORIPP) and a Loran Accuracy Integrity Panel (LORAPP) to assess Loran's capability to meet aviation's and maritime's most stringent requirements.
- Conducted wide area surveys of Loran transmissions to develop more precise additional secondary factors (ASF) for Loran and thereby significantly improve accuracy and integrity.
- Installed time of emission (TOE) equipment at Loran secondary stations to support ASF development and synchronize stations.

AND–710 Team
(Front L–R) Tim Hall, John Rickards, Toni McCombs, Judy Oliver; *(Middle L–R)* Steven Hodges, Carlos Rodriguez, Richard Lay, Gary Skillicorn, Susan Houston; *(Back L–R)* Ted Urda, Dieter Guenter, Melvin Brown, Shayne Hallauer, Ray Wasilko, Rick Packard

Local Area Augmentation System

LAAS FedEx Flight Trials



LAAS Architecture

LOCAL AREA AUGMENTATION SYSTEM

Description

The Local Area Augmentation System is an augmentation to GPS that focuses its service on the airport area (approximately a 20-30 mile radius). It broadcasts its correction message via a very high frequency (VHF) radio data link from a ground-based transmitter. LAAS will yield the extremely high accuracy, availability, and integrity necessary for Category I,II, and III precision approaches, and will provide the ability for more flexible, curved approach paths.

Objectives

- Update the LAAS Category I Specification.
- Award the LAAS Category I Development and Acquisition contract.
- Continue LAAS Category II/III Research Activities.
- Conduct a LAAS System Requirement Review.

Accomplishments

- Identified 10 Limited Rate Initial Production (LRIP) installation sites.
- Established requirements for complex (curved approach) procedures.
- Issued solicitation and evaluated proposals from vendors for the LAAS Category I Contract Award.

FY03 Goals

- Award LAAS Category I contract by 4/30/03.

AND–730 Team
(Front L–R) ; Deane Bunce, Adrienne Lewis, Judy Oliver, Doris Rinkus, Pamela Gomez
(Back L–R) David Roth, Hal Bell, Leo Eldredge, Jeffrey Auerbach, Amy Johns, Dan Hanlon

WIDE AREA AUGMENTATION SYSTEM

Description

In order to fully utilize the information provided by the GPS, the FAA is developing a satellite-based augmentation system (SBAS) called the wide area augmentation system or WAAS. WAAS will provide precision guidance to aircraft at thousands of airports and airstrips where there is currently no precision landing capability. WAAS will provide the necessary accuracy and integrity of information coming from GPS satellites for use in all phases of flight. Upon commissioning in 2003, WAAS will provide a Lateral Navigation/Vertical Navigation (LNAV/VNAV) capability. Shortly thereafter, WAAS will be approved for use with Landing with Precision Vertical (LPV) approaches, providing even lower minimal than LNAV/VNAV. The FAA is currently evaluating the approach to provide a GNSS and Global Landing System (GLS) capability in later years, concurrent with GPS modernization.

GEO Uplink Subsystem

Objectives

- Work towards CAI and commissioning of the WAAS system to include LNAV/VNAV capability.
- Issue a contract to lease additional WAAS geostationary communications satellite services.
- Continue efforts to promote the acceptance and adoption of GPS and SBAS applications internationally.

WAAS Reference Station

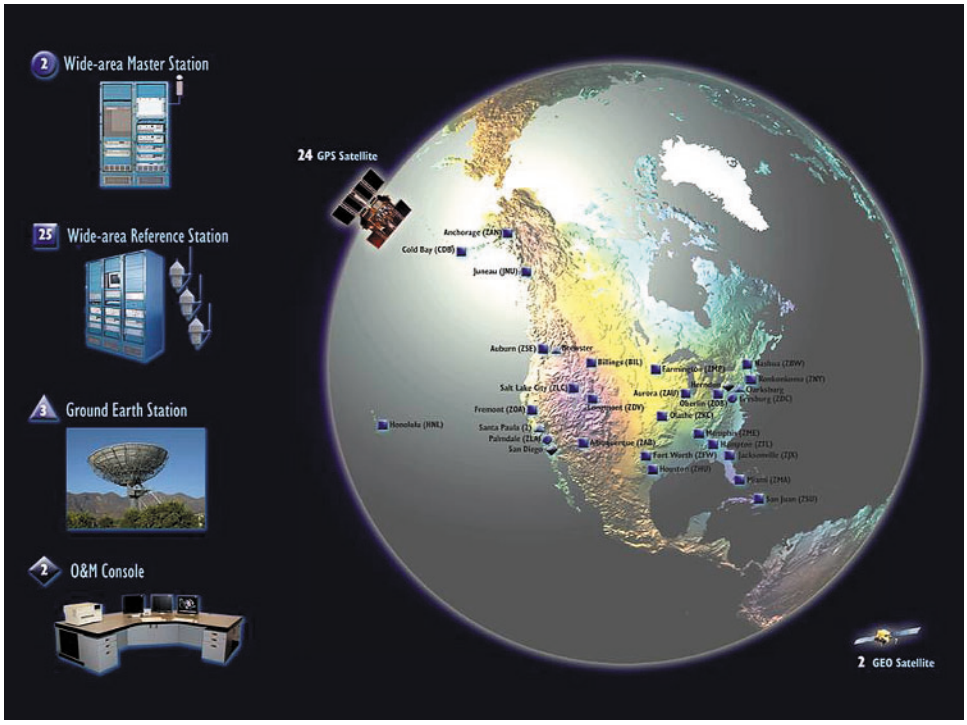
WAAS Antenna Assembly

Accomplishments

- Implementation of all the software modifications recommended by the WAAS Integrity Performance Panel (WIPP) onto the WAAS signal in space was completed in February 2002, months ahead of schedule. Technical concurrence was reached with external FAA organizations that the system meets all of the integrity requirements allocated to it. In September 2002, WAAS passed the major system test ensuring that the system meets all performance requirements.
- The WAAS program issued a Request for Offers (RFO) to acquire an additional transponder on a geostationary satellite to support the WAAS full operating capability. The RFO is also flexible enough to support acquisition of additional satellite assets as needed to replenish the current Inmarsat-3 constellation.
- The WAAS team continued to support regional satellite navigation implementation efforts and initiatives gaining momentum around the globe. This included support of a Brazilian Test Bed to support the adoption of WAAS and LAAS technologies in Latin America; conducting a GNSS seminar in India to assist in the development of a SBAS for the Indian subcontinent; and continued support to the Asia-Pacific community as it moves towards satellite navigation. This work is in support of FAA's international cooperative efforts and commitment to providing technical assistance and information to countries and regions worldwide.
- WAAS signal in space has operated continuously since August 2000 and is in use by over 1 million non-aviation users.

FY03 Goals

- Award geo-stationary communications satellite contract by 6/30/03.
- IOC commissioning by 9/30/03.



Wide Area Augmentation System Architecture

AND–720 Team
(Front L–R) ; Rebecca Salazar, Steven Wolf, Manuel Vega, Erika Anderson, Vonya Brown *(Back L–R)* Lesly Samedy, Deborah Lawrence, Gary Rixmann, Dave Peterson, Leonixa Salcedo, Michael Etchart

NAVIGATION SYSTEMS IMPLEMENTATION PRODUCT TEAM

APPROACH LIGHTING SYSTEM IMPROVEMENT PROGRAM

Description

The Approach Lighting System Improvement Program (ALSIP) program was primarily established to replace older rigid structure approach lighting systems with low impact resistant structures. In the late 70's, the National Transportation Safety Board recommended the FAA expedite the retrofit of approach lighting systems structures with frangible materials and fittings.

Objectives

- To replace obsolete MALSR and ALSF-2 rigid structures with frangible structures. The replacements will enhance safety, reduce energy consumption, and maintenance costs.

Accomplishments

- Returned to service 4 ALSF-2 and 5 MALSR systems.

TRANSPONDER LANDING SYSTEM

Description

This new navigational aid provides precision horizontal (Localizer) and vertical (Glide Slope) guidance for landing aircraft. Upon type acceptance and approval for use in the NAS, the TLS will provide CAT I precision approach guidance to one aircraft at a time. This system can be used as a special approach at small airports and will not be approved for public use in the NAS.

Objectives

- Complete type acceptance of the TLS and installation of Congressionally mandated systems.

Transponder Landing System

Accomplishments

- Completed site surveys for all FY02 Congressionally mandated sites: Bennington, VT; Elko, NV; Friday Harbor, WA; Minden–Tahoe, NV; Reno Stead, NV; Sandpoint, ID

AND–740 Team
(Front L–R) ; Steven Lindquist, Erika Anderson, Billy Nesmith, Seth Couslar
(Back L–R) Bill McPartland, Lansine Touré, Monique Lance, Stephen Burnley

ILS Glide Slope Antenna Array

INSTRUMENT LANDING SYSTEM

Description

The ILS has been the mainstay of landing aids for well over 50 years. The modernized versions used by the FAA provide aircraft with precision vertical and horizontal navigation guidance information during approach and landing. Associated marker beacons and Distance Measuring Equipment (DME) identify distance to the runway. The attractiveness of ILS lies in the economy of its avionics costs and its wide international acceptance. Technology advances over the years have yielded great improvements in accuracy, dependability, and maintainability.

Objectives

- To procure and install ILSs to satisfy new establishments and replacements in support of category I/II/III instrument approaches and to enhance airport capacity and safety.
- ARA Goal to commission six ILS by 9/30/02.
- Develop requirements.
- Prioritize projects.
- Initiate implementation.
- Maximize obligations.

Accomplishments
- Exceeded goal by commissioning or returning to service 31 full ILSs. (9/02)
- Commissioned or returned to service 2 ILS localizers. (9/02)
- Commissioned or returned to service 4 ILS glideslopes. (9/02)
- Prioritized projects within ARN/AOP/AND.
- Released market survey for future ILS procurement. (6/02)
- Procured 60 ILSs during FY 2002.

FY03 Goals
- Commission new or returned to service: 2 ALSF-2s, 10 MALSRs, and 15 ILSs by 9/30/03.

RUNWAY VISUAL RANGE

Description
The RVR system combines the measured values of visibility, background light level, and runway light intensity to determine the runway visual range, the distance a pilot should be able to see down the runway on takeoff and landing. This value is used by air traffic controllers to define the precision category of operations at an airport. The new generation RVR system incorporates the latest technology, including the forward scatter visibility sensor. This sensor determines visibility by measuring the amount of light scattered off obscuring matter such as fog, rain, or snow. The new generation RVR operates in all meteorological conditions and can accurately measure runway visual range values between 6,500 and 150 feet.

Runway Visual Range
Older Transmissometer RVR (left),
new generation Forward Scatter RVR (right)

Objectives
- To procure and install RVRs to satisfy new establishment and replacement requirements in support of Categoy I/II/III instrument approaches and to enhance airport capacity and safety.
- ARA Goal to commission 6 RVRs by 9/30/02.
- Develop new performance specifications for next generation RVR.

Accomplishments
- Commissioned nine RVRs.
- RVR Performance Specifications FAA-E-2772A approved.
- Awarded contract to continue delivery of RVRs to airports.

FY03 Goals
- Commission or return to service 10 RVRs and award a new RVR contract by 9/30/03.

LOW POWER DISTANCE MEASURING EQUIPMENT

Description
DME is a critical component of instrument landing capability for precision and non-precision approaches that measures the distance from the aircraft to the runway.

Objectives
- To procure LPDME systems to replace obsolete systems collocated with ILSs and terminal Non-Directional Beacons (NDBs) and to satisfy new requirements.
- ARA Goal to deliver 8 systems for installation and commission three systems by 9/30/02.
- Deployment is contingent upon successful development of RMM interface utilizing Simple Network Management Protocol (SNMP) version 3.

- The Commerical Aviation Safety Team (CAST) identified approximately 177 requirements for establishing DMEs at various airports.
- New LPDME contract was awarded May 30, 2002 for procurement of up to 75 systems per year.

Accomplishments
- Commissioned seven LPDME systems. (9/02)

FY03 Goals
- Commission or return to service 3 LPDMEs by 9/30/03.

VERY HIGH FREQUENCY OMNI-DIRECTIONAL RANGE

Very High Frequency Omni-directional Range

Description
The Very high Frequency Omni-Directional Range is a ground-based electronic system that provides azimuth information for high altitude routes and airport approaches.

Objectives
- To maintain a highly reliable, safe, and efficient ground-based navigation system through relocation or conversion to Doppler configuration of VOR facilities.
- VOR relocations underway.
- Doppler conversions ongoing.

Accomplishments
- Commissioned VOR facility at Gainesville, FL. (11/01)
- Provided replacement batteries to Hobart, OK. (5/02)
- Provided replacement batteries to Tulsa, OK VORTAC (VOR co-located with a TACON) facility. (5/02)

HIGH INTENSITY APPROACH LIGHTING SYSTEM WITH SEQUENCED FLASHING LIGHTS

High Intensity Approach Lighting System with Sequenced Flashing Lights
Alliance Airport, Texas

Description
The ALSF-2 is a high intensity approach lighting system installed symmetrically along the extended runway centerline starting at the runway threshold and extending a distance of 2,400 up to 3,000 feet outward into the approach zone. The ALSF-2, consisting of a combination of steady burning light bars and sequenced flashers, provides visual information to pilots on runway alignment, height perception, roll guidance, and horizontal references for Category II and III precision approaches.

Objectives
- To procure ALSF-2 to support the ALSIP and new ILS establishments.
- ARA Goal to deliver for installation two ALSF-2 no later than 1/31/02 and commission two by 9/30/02.

Accomplishments
- Six ALSF-2s have been commissioned as of 9/30/02.

MEDIUM INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR LIGHTS

Description
The MALSR is a lighting system that provides visual information on runway alignment, height perception, roll guidance, and horizontal references for category I precision approaches.

Objectives
- To procure and install MALSRs to satisfy new ILS establishment and replacement requirements in support of Category I instrument approaches and to enhance airport capacity and safety.
- ARA goal is to commission ten MALSRs by 9/30/02.

Accomplishments
- Thirteen MALSRs commissioned by 9/30/02.

Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
Pensacola, Florida

PRECISION APPROACH PATH INDICATOR

Description
The Precision Approach Path Indicator is a lighting system that provides vertical, visual guidance for pilots during landing.

Objectives
- To procure and install PAPIs to satisfy new establishment and replacement requirements in support of visual flight rule (VFR) operations; to satisfy land and hold short operations requirements; CAST requirements; and to comply with the ICAO requirement to replace VASIs with PAPIs. Additionally, several PAPIs have been installed as part of the Airport Partnering Initiative (API). The API is an effort to assist in expediting the installation of approach lighting systems stored in the FAA's Logistics Center. Participation as a pilot program has allowed for the accelerated installation of PAPIs and the replacement of obsolete VASIs. The results of this initiative will be reviewed for potential MALSR and ALSF-2 implementations.
- ARA Goal is to commission six PAPIs by 9/30/02.

Accomplishments
- Twenty-two PAPIs commissioned by 9/30/02.
- Awarded Single Source Contract for 70 systems. (9/02)

FY03 Goals
- 15 PAPIs at CAST locations will be commissioned or returned to service by 9/30/03.

Precision Approach Path Indicator

ACARS	Aircraft Communications Addressing and Reporting System
ADDE	Aircraft Derived Data Extraction
ADS-B	Automatic Dependent Surveillance – Broadcast
AFSSVS	Automated Flight Service Station Voice Switch
AIA	Afghanistan Interim Authority
ALSF-2	High Intensity Approach Lighting System with Sequenced Flashing Lights
ALSIP	Approach Lighting System Improvement Program
AMASS	Airport Movement Area Safety System
AND	Office of Communications, Navigation and Surveillance Systems
AOPA	Aircraft Owners & Pilots Association
APB	Acquisition Program Baseline
API	Airport Partnering Initiative
ARA	Research and Acquisitions (FAA organization)
ARSR-4	Air Route Surveillance Radar – Model 4
ARTCC	Air Route Traffic Control Centers
ASAS	Airborne Separation Assistance Systems
ASDE-3	Airport Surface Detection Equipment – Model 3
ASDE-X	Airport Surface Detection Equipment – Model X
ASF	Additional Secondary Factors
ASR-11	Airport Surveillance Radar – Model 11
ASR-9	Airport Surveillance Radar – Model 9
ASTERIX	All Purpose Structural Eurocontrol Radar Information Exchange
ATC	Air Traffic Control
ATCBI-6	Air Traffic Control Beacon Interrogator – Model 6
ATCRBS	Air Traffic Control Radar Beacon System
ATCT	Air Traffic Control Tower
AWOS	Automated Weather Observation System
BAA	Broad Agency Announcements
BCS	Buoy Communication System
BUEC	Back Up Emergency Communications
CAA	Cargo Airline Association
CAI	Contractor Acceptance & Inspection
CAS/LDR	Cost Accounting System/Labor Distribution
CAST	Commercial Aviation Safety Team
CCS	Command Center Switch
CDR	Critical Design Review
CFE	Communications Facility Enhancement
CNS	Communication, Navigation & Surveillance
DDC	Direct Digital Controller
DME	Distance Measuring Equipment
DoD	Department of Defense
DOT	Department of Transportation
DSP	Digital Signal Processing
DVRS	Digital Voice Recorder System
ECP	Engineering Change Proposals
ELM	Executive Level Metrics
ETVS	Enhanced Terminal Voice Switch
EVM	Earned Value Management
FAA	Federal Aviation Administration
FAT	Factory Acceptance Testing
FCA/PCA	Functional & Physical Configuration Audits
FIR	Flight Information Region
FIS-B	Flight Information Services – Broadcast
FONSI/ROD	Finding of No Significant Impact/Record of Decision
FPS	First Production System
FY	Fiscal Year
GCNSS	Global Communication Navigation Surveillance System
GLS	Global Landing System
GM	Ground Marker
GOMP	Gulf of Mexico Program
GPS	Global Positioning System
IAATC	International Advanced Aviation Technologies Conference
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
INFOSEC	Information Security
IOC	Initial Operational Capability
IOT&E	Independent Operational Test & Evaluation
IPT	Integrated Product Team
ISD	In-Service Decision
ISR	In-Service Review
ISS	Information System Security
JRC	Joint Review Council
LAAS	Local Area Augmentation System
LED	Light Emitting Diodes
LGBS	Lightning, Grounding, Bonding & Shielding
LLWAS	Low Level Windshear Alert System
LNAV/VNAV	Lateral Navigation/Vertical Navigation
LORAPP	Loran Accuracy Integrity Panel
LORIPP	Loran Integrity Performance Panel
LPDME	Low Power Distance Measuring Equipment
LPV	Landing with Precision Vertical
LRIP	Limited Rate Initial Production
LRR	Long Range Radar
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
MAR	Minimally Attended Radar
MASPS	Minimum System Performance Standards
MBTS	Monopulse Beacon Test Set
MIAWS	Medium Intensity Airport Weather System
MODE S	Mode Select Radar
MOPS	Minimum Operational Performance Specifications
MPS	Maintenance Processing System
MSBR	Master Schedule Baseline Report
NAS	National Airspace System
NATCA	National Air Traffic Control Association
NDBs	Non-directional Beacons
NEXCOM	Next Generation Air/Ground Communications System
NEXRAD	Next Generation Radar
NIMS	NAS Infrastructure Management System
NPA	Non-precision Approach
NPRM	Notice of Proposed Rulemaking
ORD	Operational Readiness Demo
ORPG	Open Radar Product Generator
OSD	Operational Suitability Demonstration
OT&E	Operational Testing & Evaluation
OX-60	Alaska Upgrades
PAPI	Precision Approach Path Indicator
PCB&T	Personnel, Compensation, Benefits & Travel
PDR	Preliminary Design Review
PODS	Proof of Concept Design
PRM	Precision Runway Monitor
PT	Product Teams
PTR	Program Trouble Report
RDVSIIA	Rapid Deployment Voice Switch IIA
RFI	Radio Frequency Interference
RFO	Request For Offers
RIRP	Runway Incursion Reduction Program
RMMC	Remote Maintenance Monitoring Capability
RMP	Research Management Plan
RMS	Remote Monitoring System
RPDE	Rapid Preliminary Development Effort
RPG	Radar Product Generator
RSE	Remote SCIP Emulator
RTCA	Requirements Technical Concepts for Aviation
RVR	Runway Visual Range
RWSL	Runway Status Lights
SBAS	Satellite-based Augmentation System
SBRII	System Baseline Review II
SCAP	Security Certification & Authorization Package
SF-21	Safe Flight 21
SIT	System Integration Testing
SLEP	Service Life Extension Program
SMR	Surface Movement Radar
SNMP	Simple Network Management Protocol
STARS	Standard Terminal Automation Replacement System
TASR	Transportable ASR-9
TDWR	Terminal Doppler Weather Radar
TIS-B	Traffic Information Services – Broadcast
TLS	Transponder Landing System
TOE	Time of Emission
TRACON	Terminal Radar Approach Control
TRR3a	Test Readiness Review Number 3
TVSR	Terminal Voice Switch Replacement
UAT	Universal Access Transceiver
USAF	US Air Force
VASI	Visual Approach Slope Indicator
VERN	VHF Extended Range Network
VFR	Visual Flight Rule
VHF	Very High Frequency
VOR	Very High Frequency Omni-directional Range
VORTAC	VOR co-located with a TACON facility
VRRP	Voice Recorder Replacement Program
VSCS	Voice Switching Control System
VSCU	Voice Switching Control Upgrade
WAAS	Wide Area Augmentation System
WIPP	WAAS Integrity Performance Panel
WSP	Weather Systems Processor

Contact Information:

AND-1/-2	(202) 267–3555
AND-200	(202) 267–3116
AND-300	(202) 493–4777
ATB-400	(202) 267–7198
AND-500	(202) 493–4939
AND-700	(202) 493–4672